MONTHLY

JOURNAL OF AGRICULTURE.

NO. 3. SEPTEMBER, 1845. VOL. I.

PORTRAIT OF A SHORT-HORN BULL:

WITH A BRIEF SKETCH OF THE QUALITIES OF THAT BREED, AND OF ITS INTRODUCTION INTO MARYLAND.

We pretend not to offer anything new in giving the portrait of a Short-Horn Bull; indeed it would be difficult to present anything in the way of form or description of the properties of cattle, with which agriculturists, at all accustomed to read the many excellent journals of the day, have not been made familiar. Nevertheless, the plan of the Farmers' Library would be but partially filled, if we did not, in due time, take care to have it represent pictorially, and in every mode of illustration, every sort of beast or bird that has been, or that probably might be profitably brought under our dominion, or employed in the purposes of the Agriculturist. We propose to make its pages the repository and instructor of the Naturalist as well as the Farmer

The animal selected has been taken pretty much at random, to give what we know to portray the characteristic points of that breed of cattle. We should have been glad now, as we shall at any time, to give the likeness of a Cow of this breed, imported from Ireland—sent out by Mr. Murdoch, a gentleman possessing a large share of various and useful knowledge, now residing at Asheville, N. C. The Cow to which we allude is *Sophy*, property of Mr. George Law, of Baltimore, and is probably equal to, if not the best milker in the Union.

The qualities of the short-horns have been so often described, and are so well known by their diffusion through the States, as to make it almost superfluous to repeat that they excel in symmetry of form, in early maturity, delicacy and lightness of head and tail, and in aptitude to lay on fat. As milkers they appear to have been condemned or approved, as purchasers have happened to get them of particular families—lactiferous secretions running in one family, as it is said, in a remarkable manner, while the fatty secretions in like manner distinguish other families of the same breed.

Then, again, the Herefords are not without their advocates, in England as well as America; while there are those who maintain that for all purposes—the pail, the shambles, and the yoke—the Devons, on a given amount of food, prove to be the most profitable, take them "by and large," for the generality of farmers and the common pastures of the country. The fine New England Oxen are deep in this blood.

To all we shall hold an even scale of comparison—giving their forms to the life, and impartially delineating their qualities on the best testimony within our reach.

We well remember the sensation made in Maryland by the first exhibition of three improved short-horns—Champion, White Rose, and Shepherdess—at a cattle-show at the old Maryland Tavern, a few days only after their arrival. The very best cattle that the country could bring together were thrown so far into the shade that their owners hardly knew where to find them; and yet there were very fine cattle on the ground, of mixed blood, from the best cattle of Holland and Ireland, which had been imported by the late William Patterson and Mr. O'Donnell—to whose public spirit, so much at that time in the lead of their cotemporaries, we would fain do justice, even at this late day.

A few days before the arrival of the cattle above named—sent out at our instance, from what we had read of the excellence of short-horns—Governor Lloyd, a very large landholder and accomplished farmer of the Eastern

Shore of Maryland, had contended that on his large estate he had cattle equal to the crack stock of England. But when these three individuals sent out by the late Mr. CHAMPION, of Blythe, Nottinghamshire, England, (and paid for by funds liberally placed there by the late ROBERT OLIVER, at our instance, merely on the suggestion of the good he might thus do to the Agriculture of the State) came upon the show-ground, Mr. L. was seen to walk round and carefully examine them, and then instantly and on the spot offered $1000 for the Bull and the Heifer, White Rose. As we had no use whatever for them, and were, moreover, bound to see the friend indemnified who had provided the credit for their importation, we told him they could not be separated, but might all three be had for $1500—somewhere about cost and charges—with which he at once closed, and bought them forthwith, and afterwards said that he considered himself reimbursed by one cross of the bull on his numerous herds on the fourteen farms he owned on the Eastern Shore. Such is the history of this first importation of short-horns into Maryland—a history that may as well be preserved here as elsewhere in the Farmers' Library, where it ought to have place; and we might, perhaps, as well add, in candor, that resemblance between Champion, at two years old, and the Bull prefixed to these hasty remarks, may have inclined us to choose him from among a variety of fine engravings (the best of them by Scott) in the London Farmers' Magazine. As we have before said, the Herefords and the Devons, and the perhaps equally symmetrical and fine soft-skinned, but not so large, Ayrshires, and the ragged-hipped, deer-necked, rich milking Alderneys, shall all—all have their full and fair chance in good time. In the meantime we present the following essay:

ON THE GOOD AND BAD POINTS OF CATTLE, AND ON THE FORMATION OF FAT AND MUSCLE.

By Mr. ROBERT READ, V. S., Crediton.

The skin or external envelope in the ruminantia herbivora is an important feature in developing the disposition of cattle to fatten, and is of much import to the farmer and grazier.

A good skin is known by the familiar name of *touch*—that is, the animal should possess a mellow skin, with resiliency, moderately thick, yet loose and yielding to the fingers when gently elevated, and resuming its station with an elastic spring, as if there was underneath a tissue of wool impregnated with oil. The resilience of good skin in an animal depends on the organization beneath it, and the presence or absence of cellular or adipose tissue. The existence of this membrane constitutes a good handler—the deficiency the reverse.

The pilary or hairy covering should be thick, not coarse; glossy and soft, with an inclination to yellow, and in proportion as this exits as a quality or constituent, so is the propensity to fat: on the other hand, a thinness of hair and coarseness in fibre denotes an unthrifty animal, more especially if conjoined with a dense firm hide or skin, and with short hair. This implies a bad handler, and is a sure indication of being a slow feeder, with a tardy disposition to increase in volume, either of fat or muscle. It is by the feel of the cutaneous tissue that a judgment is formed as to the state of maturity now, and that an opinion be formed of the condition and worth hereafter. The beautiful mossy skin, that seems like soft velvet, its peculiar feeling as if it were stretched over a bed of down, when the fingers are applied, and its easy resilience when traction is made use of, are the best and surest prognostics as to the future worth of the animal.

Physiologically speaking, a mellow skin arises from a free circulation of the vascular system through the meshwork of the cellular or adipose tissue, or those cells that are destined for the reception of fat. These tissues are considered by some alike synonymous anatomically. They are always in a moist state, from the internal cavity of the cell performing the office of exhalation. Want or supply of interstitial deposit makes a good or bad skin.

The adipose and reticular tissues are extremely vascular, more especially that portion in immediate connexion lying under it. A good and kindly handler has a full development of this material well spread over the superficies of the external frame under the skin. The membraneous tissue is a bed for the origin of the absorbents, and the adipose tissue is the depository in which the fat is deposited by the exhalents peculiar to it. These membranes participate in the character of the hide. They are more dense and inelastic, and less expansive. They do not admit of being so readily dilated by the interstitial deposit, and, consequently, are longer in acquiring a mature state in the progress of making fat.

A thick and unyielding hide, not succumbing to the internal deposit in the adipose tissue under the skin, is thus continually reacting by pressure on the absorbents, and in this manner makes the animal slow in accumulating fat on the external parts of the frame. The difference in the feel between the glossy and coarse-haired animal is dependent on the secretion from the cutis. In the thick skin it is more inspissated, and exfoliates in branny scales. In the mellow and glossy skin it is more oleaginous, which may also be accounted for. Its having a greater freedom for the assimilation of nitrogen—one of the compounds of ammonia—a chemical agent that is abundantly given off from the skin and uniting with the unctuous exudation of the cutis, gives to the skin that peculiar saponaceous feel so necessary as the index of that organ performing its healthy functions, and may be ranked as a sure symbol of early maturity.

The ears should be of a fair proportion, not over large, thin in texture, and capable of free and quick motion. A good ear denotes good quality; a coarse ear, thick and large, is generally associated with much coarseness in the animal. A good ear is nearly always found in combination with a prominent and beaming eye, with thin palpebræ or eyelids.

This development of eye is most times in unison with a good and clean horn, tending to a very slight red at the radicles or roots. This indicates also a kindly disposition to early maturity. The happy and beaming eye of the healthy

animal shows contentment, a very desirable omen as to the quick growth of the animal; while, on the contrary, a heavy eye, with a want of vivacity, with thick eyelids, and a too visible conjunctiva or white of the eye, is indicative of an unhappy and restless temper, incompatible with a good and profitable feeder. The eye of contentment, of quietude, and of calm expression of countenance, is alone compatible with that temperament so conducive to accumulation of flesh and fat. These qualities, if derived hereditarily, will be maintained throughout the whole evolution of growth. They are also well-known signs of early disposition to maturity.—The hereditary principle should always be borne in mind—the old adage of "like will beget like"—whether applied to the symmetrical law of external form, of quality, of temper (either good or bad), of constitution, of a disposition to make either fat or muscle, or to any other cause inherently acquired. Therefore the only method to ensure those qualities which are so essential to the welfare of the farmer, is to commence primogenitively with the best and most approved principles that have hitherto been found to ensure a healthy and profitable stock.

I shall now speak of bone, as being the framework on which all the materials of the body are built. It should, when examined in the living animal, have the appearance of being fine and small in structure. It then augurs a good quality and being readily disposed to fatten, although it sometimes betrays too great a delicacy of constitution. A bone may be small from a consolidation of its structural parts, yet be capable of sustaining more weight, superincumbently, than bone of a larger size, and whose size depends only on the cellular expansion, and not on a cylindrical consolidation. A large bone maintains a coarse-bred animal, a dull feeder, with a torpid vascular action, that only tardily irrigates the frame with the living stream. Such animals have a greater disposition to lay on more muscular than fatty substance.

Having concluded my observations on the external structure, relative to the propensity animals have of making fat, I shall now offer a few opinions on the arrangement of the internal organs for that purpose.

The lungs should be large; but not occupying the chest too much posteriorly: the chest capacious, and deep anteriorly; these being the organs for preparing the arterial blood that nourishes every part.

I have also remarked, from inspection after death of hundreds of animals, that the roots of the lungs do not diminish in size so much as that portion which is in contact with the midriff in the fattening animal: lungs over large are not more productive of fat than those which are of a moderate size. My solution of this fact is, that if the lungs occupy too much of the chest in the posterior part, there is a limitation to the expansion of the rumen, or first stomach, and the animal does not enjoy so much lengthened quietude in rumination, a circumstance very essential to the fattening beast. This substantiates what I have before stated. The chest cannot be too deep nor yet too broad in its anterior external conformation; therefore, instead of attributing the full, spreading, wide-ribbed chest, posteriorly, as instrumental to the lungs, the space for the expansion of the stomach must not be overlooked, a large digestive apparatus being required for all large herbivorous animals. The heart is an important organ in the animal frame. It is rarely found over large in the fat animal. It is the forcing pump by which the whole of the body is irrigated through the arterial tubes. If symmetrical organization pervades throughout the animal, the chances are, that the vascular action will harmonize over every part, and the deposit of fat will equalize over the whole of the body. On the contrary, an animal with disproportionate parts will have a greater disposition to lay on muscle or fat on those parts respectively that have the greatest share of vascular action.

I am now proud to state some indisputable facts. I have many times examined animals by mediate auscultation, with capacious chests anteriorly, and the lungs duly inflating them. Previous to their being stall-fed, they have, when slaughtered, lungs small posteriorly. It is also certain, that if an animal dies well, the lungs will be found disproportionate to what they must have been in the living animal.

I do not agree with the generally received opinion, nor with Dr. Lyon Playfair, that the lungs must be of necessity small when an animal first begins to fatten; but, as the fattening process goes on, the internal cavity of the chest becomes smaller, the action of the heart weaker, and the lungs diminish in size in a regular gradation from various causes; first, from limited expansion; secondly, from absorption, and by pressure of the surrounding parts; and, lastly, from quietude never allowing their due inflation, which the act of depasturation affords.

The liver is also found small. This I consider to be from absorption and internal pressure of the surrounding organs. The liver has also a diminished supply of intestinal and mesenteric blood, from the appetite not being so vigorous, and less food being eaten, as the animal grows to maturity.

I have known many animals die from accident, that, on inspection after death, have had large lungs and livers. They were in lean condition, but had every good quality for fattening; and I have no doubt would have made prime fat beasts, and whose lungs and livers probably would have been smaller when slaughtered.

I do think that Dr. Lyon Playfair is wrong in the opinion, that small lungs and livers are the best organs for the assimilation of food and fat. I think that the reason why animals become speedily fat in proportion as they approach maturity, is from the arterial action being slow, and the venous circulation impeded from the pressure of the accumulating fat. The arterial exhalents deposit more than the venous circulation can return, or their absorbents take up. Thus the harmony is broken. It is a fact well-known, that very little blood of the venous kind can be taken from the fat animal. From what I have stated, taken collectively and in conjunction with the primeval external conformation of the animal, may be deducted those determinations which tend to either the formation of fat or muscle.

The tendency of certain articles of food to fatten stock, and the suitability of others to keep up the general growth, afford a fruitful field for inquiry. I shall begin with those that favor evolution of growth. A series of substances that are charged with albumen or a vegetable gelatine, are nitrogenized in the maximum:—barley, oats, peas, and beans, form examples. These substances, having much nutritive matter, make the best food for the purpose of general growth, with the various herbivorous food for the young animal; but the more such food ap-

proximates lignin, the more insoluble and innutritious it is.

Herbivorous food for the young animal is naturally required, from its abounding with several elementary principles, as ammonia, &c. in unity with earthy matter; which, taken in with the food in depasturing and uniting with the inherent formation of phosphoric and muriatic acid (and the phosphoric acid in the farinaceous food,) form the phosphate and muriate of lime. Wheat, with the gelatine of the farina, constitutes the formation of bone; hence the necessity, or rather advantage, of supplying the growing animal with such a material.

The next series of substances are those which contain the saccharine principle, and are nitrogenized in the minimum. They are disposed to the formation of fat. They consist of the different sorts of bulbous or esculent roots, as turnips, mangel, beet, &c. These substances, when mixed with the nutitrive matter of the farinacea, constitute the essential compound necessary for the production of fat and muscle in the animal body.

The table subjoined is one of equivalents, by the celebrated chemist, Brande, showing the relative quantity of albumen and other matter in leguminous and bulbous food.

100 Parts.	Soluble Nutritive Matter.	Starch.	Vegetable Fibrine or Albumen.	Saccharine Matter.
Barley	92	75	10	7
Oats	75	60	13	2
Beans	80	52	25	3
Acorns, 2 months dried	69	40	27	2
Swede Turnip	6¼	¼	1¼	4¼
Common Globe	4¼	¼	¼	3¼

This table is practically one of my own, as to the quantity of nutritive matter in the acorn. On reference to it, any one will quickly perceive those bodies which dispose to make fat or flesh: thus experience has shown the decided advantage of giving to animals bulbous roots, with those substances rich in albumen, when they are preparing for the butcher, and when growth is requisite to be freely allowed to the young depasturing beast. Gelatine, a substance naturally abundant in the vegetable creation, is also a chief ingredient in the animal tissue.

The scientific agriculturist will discover the best method on reference to the table. As far as philosophy teaches, those substances that have the property either of forming fat or muscle, are the azotized and non-azotized food in their relative proportions. The disposition of certain breeds to make fat internally, and of others externally, is a physiological fact, which can only be explained on the principle of those breeds acquiring such a disposition hereditarily, or it may be from the animal possessing such an aptitude from the method of feeding in conformity with the selection of food. Now the breed of the South Devons are coarse, bony, large animals, and not disposed to make fat on the superfices of the body, but more internally: the North Devon is a small-boned and kindly animal, and disposed to fatten either externally or internally. A North Devon is a bad handler, with other points good: physiologically, we should infer that fat would be deposited internally, from the skin being thick and inelastic, showing the absence of those tissues that are for the reception of fat externally. Suppose we have a South-hammer, a good handler, with a mellow and plastic skin, and every other denotation of being disposed to fatten, the probability is, that the fat would be deposited externally. In my humble opinion it is so with every other breed. We must attend more to the external form and quality, in conjunction with locality, climate, and soil. Guernseys or Alderneys make fat but very indifferently externally. I well know practically, that an animal of either breed, with a good skin and good bone, &c. is inclined to fatten on the outside; but, when such is the case, there is an absence of it internally. The circulatory system, with the local form of an animal, may also be reekoned amongst those causes which tend to balance the fat indiscriminately either inside or out. Say that an animal kindly disposed to fatten has a few points that preponderate; for instance, he is large over the sirloin—the blood vessels, nerves, and muscles of such a part take on a corresponding size. When he begins to have more food given to him, the circulatory system becomes more full of blood, and, as a natural consequence, the larger parts have a greater influx of blood—thus the growth of these parts either in fat or muscle, and they become of larger proportions, and deposit more fat than those which are not commensurate in vascular action.

Before concluding these remarks I beg to offer an opinion respecting small lungs, as stated by Dr. Lyon Playfair (at a meeting of the council of the Royal Agricultural Society) that they are more favorable to the formation of fat. Dr. P. says, horses have large lungs. I well know, and not speculatively, that horses, if fed on meal and potatoes, or turnips, quickly and rapidly make fat. In fact, this is the compost that horse dealers use to puff up the farmers' cattle, so as give them a glossy and plump look previous to sale, and the being put to work in this state oftentimes causes their death. On opening them, I have seen them loaded with fat.

Now this is not in accordance with Dr. Playfair's views. My firm conviction is, that animals with small lungs in their growing state will in proportion suffer in their external form. From observations I have made on animals of divers breeds, I have come to the conclusion, that they make fat internally or externally, regularly or irregularly, in accordance with the organization in structural arrangement, linked with those grand principles that modify the external conformation of every animal, locality, clime, and soil; and. lastly, the manner in which beans and acorns harden the flesh of animals. That they do so is an undisputed fact. The hardness of flesh or muscle depends on the richness of its lymph or fibrine. Beans and acorns contain large quantities of vegetable albumen compared with any other food given to horses or cattle. It is on this account, that food which contains a large share of albuminous constituents, when given to horses, cattle, or pigs, makes them develop so great a degree of muscular firmness; but when substances rich in starch, mucilage, gum, or the saccharine principle, are added to beans or acorns, the hardness of the flesh becomes lessened, and the fat more emollient. I have pratically proved this with horses. I have given beans and acorns to horses with hay-chaff on the farm. The muscular power has been augmented, the flesh feels hard, they work well without fatigue, do not perspire, and, in fact, they are in full vigor. I have altered

their diet, and given, instead of chaff, turnips, either the Swede or common Globe, and the effect is soon visible. The flesh becomes soft and puffy—little work excites perspiration—in fact, the animal is soon reduced from a state of good firm condition to one bordering on debility. From the taking away those substances, beans or acorns, which possess in a maximum degree the richest albumen, and the supplying those that contain it in the lowest degree, or minimum, the albuminous principle exists in several forms; and by it the living materiality of the animal body is by a law of animal chemistry built, under the guidance of immateriality.

[Veterinarian.

ST. JOHN'S-DAY RYE, AND LUCERNE,

HOW TO BE CULTIVATED FOR EARLY GREEN FOOD,

The economy of American Husbandry, is, according to our observation, in few things more deficient than in the common failure of farmers to take measures of precaution to have an early supply of green food for their stock, and especially for their work horses and milch cows, at that most trying and equivocal season of the year, which falls in just between Winter and Spring; and which is yet neither the one nor the other as respects temperature or vegetation; for even though the crop of hay, and of fodder, may be reasonably abundant, and sufficient, in ordinary years, to last until "grass comes;" yet if the Winter should happen to be unusually protracted, it becomes impossible to eke out their fodder until that time does come. In that case the cattle are turned abroad to glean a scanty supply of half-opened buds in the woods, and of young grass which is insufficient in quantity, substance and nourishment. This is the time, and this the occasion, for the sagacious Farmer to manifest his judgment and forethought. In later Spring, and midsummer, any sort of a manager may have sleek horses and fat cattle; but the sign and the honor of good management consists in maintaining them in uniform condition, or nearly so, throughout the year. "*Well wintered—half-summered*" is the motto of all good stock-masters. Thus it becomes important to determine the surest substitute for short crops of hay, and the most succulent, natural and wholesome food for Spring, even though hay should be plenty. The best reliance within our knowledge for a very early supply of green food, coming two weeks sooner than clover, is *Lucerne* and *Rye*—both these have we advocated repeatedly, through other channels, but, unfortunately, no class of people require to be so often reminded and urged to any new and untried expedient, as do agriculturists—not that they are not quick enough to catch a humbug as it flies along, as one of some sort does every year, generally in the Spring, such as calico-corn, California tobacco, Rohan potatoes, &c. &c., but the trial of these requires no great effort, and involves but little additional labor. Very different is it when it is proposed to try an altogether new crop, for a particular purpose, demanding care in the preparation of the ground and otherwise a considerable departure from the usual routine.

Failures in a large portion of the few attempts that have been made, as far as we know, to employ *Rye* as a *green crop* for soling horses and milch cows, at least until the clover is sufficiently advanced to take its place, have doubtless been owing, in most instances, to *want of care in manuring and preparing the ground*, by reducing it to the finest state of pulverization, and in not sowing early enough. The same may be said of Lucerne—some contend that Lucerne is apt to fail from the dryness of our Springs; though this may happen the first year, yet as it is known to send down a longer and larger tap-root than any other grass, and as all accounts, as well they may, on that account, agree that it requires a subsoil free from standing moisture. It is probable that even crops of Lucerne which present the most unpromising appearance at the close of the first year, might yet prove highly profitable subsequently, and for many years, as we have known them to do, and especially if suitably top-dressed. Having yet seen nothing to shake our confidence in the value of these grasses, if we may call them such, we shall persist in recommending them, and in enforcing our impressions by such illustrations as we may find in American and European Agricultural journals.

What we have here said is but preparatory to the re-publication of papers from foreign periodicals of late date, in which both *Lucerne* and a peculiar kind of *Rye* are recommended in the strongest terms for the purposes above named. What there may be peculiar in the "St. John's-day Rye," we know not, except from what is

said in these papers, but the patrons of the Farmers' Library may be assured that effective measures shall be taken for the importation of small quantities, sufficient for trial, in this and in all similar cases, to be distributed among them as soon as we can get time to make the arrangements. In this country it is known to us that, as in Engiand, Lucerne requires that the ground to be dry and *clean*, and we should think it probable that it might answer to sow it with rye or oats, which might assist it in keeping down the weeds the first year, where it is decided to sow it broad-cast, as we have known it to be done, with satisfactory results; but no farmer who drills it will grudge the time given to keep it clean the first year; at all events it cannot interfere injuriously or inconveniently with any but a *planter*, and even he should try it on some scale. Though there may be nothing very new in these Essays to those who have paid attention to the subject, even they may here have their attention re-drawn to the matter in a way that may at least have the effect of prompting a trial, but, small or large, let it be a *fair one*. Let the ground be well manured, as it should for every crop, but in this case with either well-rotted manure, or with bones, ashes, or guano, as being the cleanest. Let it, furthermore, be made clean and fine, and sowed [we believe] about twenty pounds of seed to the acre of Lucerne; or, if Rye, let the ground be, in like manner, thoroughly well manured and put in fine tilth, and sowed as recommended in these Essays, and we will venture to predict the most gratifying result. If the conditions are complied with, and the experimenter is disappointed, the Farmers' Library shall record the false prophecy:

ON THE ST. JOHN'S-DAY RYE.

BY PH. PUSEY, M. P.

THE late Lord Leicester advised that no farming experiment should be published until it had been successfully tried for three years.—But though I have not grown the St. John's-day Rye as yet even for two complete years, its promising appearance, and the approval of neighboring farmers, encourage me to lay a short account of this plant before the Society.—It was in 1842 that Mr. Taunton, of Ashley, near Stockbridge, first made it known to me in the following terms:

"In your digest of the progress of agricultural knowledge, you say, of early Rye, that 'some farmers do not approve of it; for while young it gives but little food, and it shoots up rapidly to a harsh stalk, which stock do not relish.' But this reproach does not apply to the variety of Rye which is the best worth cultivating, and, as I think, the only one worth cultivating to any extent for the purpose of green meat—namely, the St. John's-day Rye, *(seigle de St. Jean.)*—This plant, if sown in proper time, and on a suitable soil, presents itself to the scythe in a state palatable to horses for full three weeks, or more. I would sow not more than one-fourth of the ground with common Rye by the side of it, for the common Rye is a very few days earlier, and, by the time when that becomes harsh and woody, the St. John's-day Rye has attained its perfection. Of this latter I have had, on a suitable soil, to the extent of 11 London loads of straw per acre, when left for seed; for it will grow from 6 to 7 feet high. The time to sow it is the 24th of June; at all events get it in before July. The soil for Rye ought to be a siliceous soil; it does not reject a considerable admixture of clay, but it ought to come under the description of a sandy loam. If you want such a burthen as I have described, of course the condition of the soil must not be poor, and such produce will pay for good land. The soil, too, needs to be compressed after sowing, if the land be at all light, by rolling or sheep-treading; otherwise the Rye-plant is peculiarly obnoxious to the wire-worm. The mass of foliage in October would induce you to feed it then; but I would recommend you to abstain: the leaf (unlike Winter barley) is very little changed by the Winter, and it so cherishes the young foliage, which shoots up in Spring covered with this dense mantle, that it will repay your forbearance with ample interest. I have seen it in the end of February, or beginning of March, equal, if not superior, to the best water-meadow for ewes and lambs; for soiling in stable, the horses will eat it when the ear is fairly developed—and it may, perhaps, be 5 feet high, (according to the soil;) it will have tillered so much that the produce will be a very heavy one."

In June of the following year (1843) Mr. Taunton sent me another account of his further success in the growth of the St. John's-day Rye:

"I enclose to you a stalk of my St. John's-day Rye, length 6 feet: it has not yet flowered. I began to soil eight cart-horses with it on the 13th of May, then 3 feet high, and four cows a week later. Both these kinds of stock still eat nearly the whole of it, with scarce any waste; so that it has now been twenty-two days in use, and I expect that they will eat it freely some days longer: thus, you see, extending its eatable state nearly to a month. If I had possessed a greater breadth of this crop in the present season, I should have begun a week earlier, not waiting till it had attained the hight of 3 feet.

"The ground which bore this had a dressing of dung just before sowing. It succeeded wheat, cut green into stable; but your calcareous grit detritus is a far more favorable soil for Rye than our chalk.

"This plant, and, I believe, this variety, proved fatal to hundreds of our brave men on the sandy plains of Belgium, two days before the battle of Waterloo. They marched through fields of it higher than their heads. The glittering points of their bayonets marked the track of their march to the enemy's artillery, which was on an eminence, while the Rye being higher than their heads, they could see no enemy, and knew not whither to direct their fire."

Mr. Taunton having presented me with some seed of this Rye, it was sown in the course of July, 1843, on some poor moory soil, without manure; was fed off in the Autumn, and again in the Spring; yet produced, on little more than a quarter of an acre, 13 bushels of seed. That seed was sown again last year in August, as soon as harvested: it produced on a sandy loam very good feed in the Autumn, and in this backward Spring it realised Mr. Taunton's description, and established its character here by cov-

ering 4 or 5 acres with a thick coat of herbage, in which the lambs were browsing breast-high, while there was little or no other feed in the neighborhood. I find, too, in the late Mr. Rham's Dictionary of the Farm, a yet more favorable account of it. Under the article Rye, in that convenient little book, our lamented colleague observes: "There is a variety of Rye mentioned by continental authors by the name of St. John's-day Rye, because it grows so rapidly that if sown about St. John's-day it will be fit to mow green by the middle of September; and in favorable seasons may be fed off again in November without preventing its giving ample feed in Spring, and a good crop of grain at the next harvest. It might be advantageous to introduce this variety into England, if it be not already known." On the other hand, it is right to state that, when our seedsman, Mr. Gibbs, inquired respecting it in its native country, he was informed that its cultivation was not spreading in Belgium. But the reason assigned was its inferiority to the common Rye in yield of seed; and this objection, though valid in countries where rye bread is eaten, will not apply where, as in England, Rye is intended principally for green fodder. Although then, as I said, my trial of the St. John's-day Rye is incomplete, and though it has not been sown here as yet on its peculiar day, it has evidently two advantages over the common Rye. It tillers so much as to produce double the quantity of herbage on the same space of ground. Indeed, in one field where the two varieties were growing together, the common Rye, after twice feeding off, became so thin that I plowed it up; while this new Rye covers the ground with its third crop as with its first. Besides tillering more, it is also sweeter than the common rye when young. Where they grow together, the hares and rabbits, while we had any, ate it before the other. Its principal merit, however, is its superior sweetness in advanced growth, and the consequently longer time during which it remains fit for use as spring feed. Good farmers who have seen it agree with me, that this new Rye should be tried upon such light hollow soils as we sometimes find on our southern chalk-hills. On such land, in dry seasons, farmers often lose their turnip crop after it is singled out; but Rye is known to bear well such looseness of soil. If it were sown instead of turnips, or where the turnips had missed, on a part of the turnip-land, even one green crop in the Autumn, to say nothing of two, and another in Spring, might compensate for such a crop of roots as this land generally yields. If it stood for seed afterwards, it would then also take the place of the barley crop—the turnip's natural successor; and the rotation would remain undisturbed. I will only add one suggestion, or rather call attention to a statement of Mr. Taunton's, that if the St. John's-day Rye be left uneaten in the Autumn, it will afford feed for ewes and lambs equal to the best water-meadow, as early as the beginning of March or the end of February—an invaluable time for such feed. All that is hoped of a new plant is seldom realised in practice; but what I have myself seen of the St. John's-day Rye, and the opinions of farmers who have also watched it, make me sure that I should not be rash in advising occupiers of light lands to give it a trial, but that unfortunately, as I am informed, no seed is now to be procured abroad with a certainty of its genuineness.

Pusey, May 12, 1845.

ON LUCERNE, AND THE PREPARATION OF THE LAND.

BY J. TOWERS.

THE more we see of Lucerne, the more have we cause to be delighted. In Thanet, and such chalky districts, it forms the chief article of green fodder, for upon such soils meadow-grass will not thrive to perfection.

The land which the plant affects is a rich, mellow loam, not very heavy, but unctuous, reposing upon a chalk rock, at a foot or more below the surface: but Lucerne will prosper well in any good garden soil, and continue in heart for eight or ten years, yielding, in showery seasons, five, six, or seven cuttings every season, provided the foolish, unremunerative practice of leaving the herbage to stand till the flowering be abandoned.

I propose to treat of the culture of Lucerne experimentally, after assuming that it is essentially a lime plant, since it has been found that the ashes contain, of phosphate of lime, 13 per cent.; chalk, or calcareous matter, 50 per cent.

If these be only approximations, we are taught thereby that lime or its combinations form the specific and appropriate manure; and, therefore, that in any inland county on the south side of Yorkshire, there can be little difficulty in securing a great return for comparatively a moderate degree of labor and attention.

I shall suppose a case which is of common occurrence—that of an old pasture, foul with meadow crowfoot, *(ranunculus acris,)* dandelion, &c., which requires to be broken up. The *land must be cleaned*, and this is best effected by paring and burning, by which myriads of the wire-worm may be destroyed, and some alkali and calcareous matters produced, in the form of ashes. These ashes are to be scattered over the pared surface, and then the ground should be trenched two good spits, or eighteen inches deep. At the bottom of each trench, and again over the first returned spit of earth, a two or three-inch stratum of street or spit dung, or of prepared *cloacene*, should be laid. By prepared cloacine, I mean the contents of a privy, mixed with twice or thrice the volume of loam or good earth, over which has been sprinkled two or three gallons of diluted sulphuric acid to fix the ammonia. This compost, after standing six months and being once turned and mixed, would prove an excellent phosphated manure.

When the trenching is completed, a further dressing of dissolved bones should be given in the following manner: For the half of an acre, take one bushel and a half of true bone dust, one-third of its weight of concentrated sulphuric acid, and three times its weight of water. Put the last into an open tub, pour into it gradually the sulphuric acid, stirring with a wooden oar, then add the bone dust. Stir from time to time, till the mixture assume an uniform consistence, and it will consist of sulphate of lime and phosphate of lime, with an excess of phosphoric acid. Incorporate with it so much dry, sandy earth, saw-dust, or fine coal ashes, as will bring it to the temperament of moist garden mould; then deposit it in heaps on the land, and when pretty dry, scatter it over the ground; after which, fork the surface, and sow the seed as the work proceeds.

If, however, the land be somewhat foul with root weeds, it will be better to crop the whole piece with potatoes in the first Spring, omitting

the bone dress, and to harrow or thoroughly rake the land once or twice; after which, the hoeings required during the growth of the potatoes, and the digging up of the crop, will pretty effectually clean and prepare the soil, especially if it be set up in high ridges during Winter.

Lucerne seed costs about 1s. or 1s. 3d. per lb. I have steeped it in nitro-sulphates, in order to try their efficacy, and have also on the same day sown the unprepared seed, employing artificial heat; and both have germinated alike. All pasture seeds ought to be so tested, because of existing frauds; but if the sample be proved good, five or six pounds will sow half an acre, provided the rows be 12 or 14 inches apart, but some recommend 8 or 9 inches. The drills are not required to be more than an inch deep, and the seeds should not be thickly deposited. The best season is mid-April; but June, if showery, will do well. The germination is rapid; and when the plants are safe from the first assaults of insects, (lime dust is a preventive remedy,) they should be thinned to three-inch distances at first, and subsequently to six inches, surface-hoeing the plot with the spad or Dutch hoe.

It is astonishing how productive the plant becomes during the first Summer, provided the weather be showery, with intervening periods of warm sunshine. I have cut six or seven swarths of fine, lush herbage, between an April sowing of the seed and the end of the following October; and have found the part first cut ready for the scythe again by the time that the cutting was completed.

During the course of the first Summer, the land should be kept perfectly clean; it will also be prudent to cut but twice, and then only when the plant shows its blossom *buds*, never suffering a seed to form, nor, indeed, the flower to expand. It is the chief object to obtain a strong and vigorous crown in the early course of the plant's growth; and this is done by leaving it to attain that maturity which is indicated by bloom: if cut in the first instance, while purely succulent and immature, the same debilitating effect might result which would be produced by cutting-over a fresh plot or bed of very young asparagus; for both plants produce crowns, which form round the first collar and much extend its bulk. In fact, if Lucerne be thinned out to six-inch distances, the entire spaces will shortly be filled up by lateral developments.

The hoe ought to be very effectually used so soon as every portion is cut, in order to exterminate weeds, and particularly tufts of grass; or in lieu of the hoe, a two-pronged bent or drag fork, with broad tines and a long handle, would be found a very effective tool. The *habit of growth*, with strong, deep roots, and extending crowns, indicate plainly that sheep should never be suffered to depasture the autumnal herbage, for their bite is so close that numbers of the best plants would be sacrificed. Therefore, at the final cutting of the season, which ought not in general to be made later than the middle of October, the ground between the rows should be hoed; and when Winter sets in, a dressing of fine coal-ashes mixed with bone-dust—nine bushels of the ashes to one of the bones, for every half-acre—will prove very beneficial to future growth. Gypsum might be added to the extent of the bones, and this would give more quality to the ashes, which frequently contain about one-tenth part of sulphate of lime; the remaining nine-tenths being chiefly impure silex, with a little iron.

If *Lucerne* have been sown in deeply prepared and enriched earth, dung and putrescent manures as top-dress are seldom required; whereas good *inorganic* manures tend to keep the surface-soil pure, light, and free from weeds.—This is of consequence, as otherwise, when once tufts of grass obtain possession, patches will speedily occur, and the compact beauty of the rich herbage will disappear.

I have lately inspected a small piece, that I remember to have observed eight or ten years since, then growing and producing abundantly from April to November; the rows are above fourteen inches asunder—the plants in perfect order, and in straight rows, not a blank visible, and so high as partially to fall over and conceal the spaces. It was under the scythe during the first week of the present May, and was evidently carried away in detail for green fodder. The bulk was enormous; and during a season of alternate periods of rain and fine weather, this small plot, scarcely, perhaps, of twenty poles, will yield an ample supply for a cow.—The soil is now a blackish mould, full of vegetable matter, and it is kept hoed as the rows are mown.

This plot is situated near the termination of the old town of Croydon, leading from the church to the Brighton road, and is almost surrounded by dwelling-houses.

Now, as a small piece in a town can be kept in full bearing during ten years, what might not be done with a few acres among the dairy-farms of England and Ireland? Farmers shirk the *trouble of* the *hoeing*; but such mistakes, and a neglect of their own real interests, is in this, as in but too many other instances, but too apparent. There is not a plant which, if prudently prepared for, and skillfully managed, will so amply remunerate as *Lucerne*. It wants calcareous phosphates, with a good staple loam, which, if scaled upon a chalk bottom, will be thereby improved: with these, its cultivation is most simple, and the labor required is not more than that of a crop of *ridged* and properly grown turnips.

May 15th. J. TOWERS.

CAPE WOOL.—Of the Cape Wool nothing now remains to be said; it has taken its place in the grand market of Europe amongst the best, and may soon be the first in the first rank, for the Cape climate and natural grasses seem ordained to bring the merino breed of sheep to perfection. This article of export has increased in the following proportions: In 1824, 23,049 lbs.; in 1834, 143,883 lbs.; and in 1844, 2,233,946 lbs. The rate of increase in New-South Wales for similar periods of ten years, when the quantities were not far from those of the Cape, down to 1835, was as follows: In 1815, 32,971 lbs.; in 1825, 411,600 lbs.; and in 1835, 3,893,927 lbs. Thus, in the last period of ten years at the Cape (1834 to 1844), the quantity of Wool increased about fifteen times. During a similar period of ten years at New-South Wales (1825 to 1835), the increase was only about nine times. Such are the powers of the country bountifully bestowed on the inhabitants of the Cape of Good Hope.

[South African Commercial Advertiser.

NEW-YORK STATE AGRICULTURAL FAIR:

TO BE HELD AT UTICA, SEPTEMBER 17TH, 1845.

We are indebted to the politeness of Mr. Tucker for the following account of the proceedings of the New-York State Agricultural Society, in reference to the Exhibition to be held at Utica on the 17th September inst.

The public will be gratified to learn that the Annual Address is to be delivered by Josiah Quincy, Jr. *Our* anticipation of enjoyment is none the less from the recollection of having heard him with admiration deliver his commencement oration at old Harvard.

NEW-YORK STATE AGRICULTURAL SOCIETY.

The meeting of the Executive Committee of the State Agricultural Society for August, was held at the Society's room, in Albany, on the 14th. Present—

B. P JOHNSON, of Oneida, President.
E. P. Prentice, Vice-President, Albany.
Alexander Walsh, Rensselaer.
George Vail, Rensselaer.
Thomas Hillhouse, Treasurer.
Luther Tucker, Recording Secretary.

Letters were read from Hon. Wm. H. Seward, Auburn; Hon. Luther Bradish, New-York; Hon. Josiah Quincy, Jr., Boston; Isaiah Townsend, Albany; James Gowen, Esq., Philadelphia; James S. Wadsworth, Geneseo; Francis Rotch, London; James Taylor, Birmingham; Hon. John Savage, Salem; Lewis F. Allen, Esq., Buffalo; Paris Barber, Homer.

The Board proceeded to complete the list of Judges to award the Premiums at the next State Fair. The following are the

JUDGES TO AWARD THE PRIZES.

Cattle, Class I.—James Gowen, Philadelphia; J. S. Skinner, New-York; Thomas Hollis, Gilbertsville.

Cattle, Classes II, III, IV.—Adam Furguson, Watertown, C. W.; F. Ingersoll, Vernon; D. D. Campbell, Schenectady.

Cattle, Classes V and VI.—J. R. Speed, Caroline; Wm. Fuller, Skaneateles; Aaron Petrie, Little Falls.

Working Ozen.—Sanford Howard, Albany; Andrew J. Bell, Lairdsville; Squire M. Brown, Elbridge.

Steers.—E. P. Peck, Sheldon; Clift Eames, Rutland; Israel Boies, Homer.

Fat Cattle and Fat Sheep.—Ela Merriam, Leyden; Lester Barker, Clinton; P. N. Rust, Syracuse.

Stallions.—J. M. Sherwood, Auburn; Wm. Jones, Queens county; Edward Long, Cambridge.

Mares and Colts.—Anthony Van Bergen, Coxsackie; Willard Ives, Watertown; F. P. Bellinger, Herkimer.

Matched Horses.—Wm. Salisbury, Leeds; Duncan Robinson, Fishkill; H. S. Woodruff, Auburn.

Sheep, Class I.—W. A. S. North, Duanesburg; Robert Musson, Gilbertsville; Jas. Parker, Jr., Trenton.

Sheep, Class II.—S. Waite, Jr., Montgomery; W. H. Sotham, Albany; Lyman Sherwood, Auburn.

Sheep, Class III.—Chester Buck, Lowville; Sam'l Cheever, Stillwater; D. R. Gill, Henderson.

Sheep, Class IV.—J. P. Beekman, Kinderhook; J. M. Ellis, Onondaga Hill; M. Y. Tilden, New-Lebanon.

Swine.—L. B. Langworthy, Rochester; Geo. Webb, Pamelia; Hiram Hopkins, Cortlandville.

Poultry.—C. N. Bement, Albany; T. H. Hyatt, Rochester: Storrs Barrows, South-Trenton.

Vegetables.—D. B. Fuller, Hyde Park; B. W. Dwight, Clinton; H. L. R. Sandford, Volney.

Plows.—George Geddes, Tyler; C. C. Dennis, Auburn; M. L. Brainerd, Rome.

Wagons, Harrows, Cultivators, Fanning-Mills, Machines for cutting corn-stalks, Horse Powers and Threshing Machines, Drill-Barrows and Straw-Cutters.—H. S. Randall, Cortlandville; G. W. Patterson, Westfield; Myron Adams, East Bloomfield.

All other Agricultural Implements.—Pomeroy Jones, Lairdsville; John Williams, Jr., Salem; T. R. Hussey, Auburn.

Butter.—E. W. Bateman, Venice; Z. Barton Stout, Richmond Hill; Elijah Rhoades, Manlius.

Cheese.—T. C. Peters, Darien; Thomas Burch, Little Falls; Harrison Blodgett, Denmark.

Sugar.—O. Hungerford, Watertown; E. Mack, Ithaca; George B. Rowe, Canastota.

Silk.—Alexander Walsh, Lansingburgh; Samuel Thompson, Utica; John Walsh, Albany.

Domestic Manufactures.—Judge Conkling, Auburn; Roswell Randall, Cortlandville; Le G. Cannon, Troy.

Fruits.—J. J. Thomas, Macedon; Chas. Downing, Newburgh; P. Barry, Rochester.

Flowers.—Prof. Jackson, Schenectady; Benjamin Hodges, Buffalo; Charles Tracey, Utica.

Plowing Match.—Lewis F. Allen, Buffalo; N. S. Wright, Vernon Centre; E. Marks, Tyler; William Ottley, Oak Corners; John Johnston, Geneva.

Miscellaneous and Discretionary Premiums.—Thos. Farrington, Owego; B. N. Huntington, Rome; Joel Rathbone, Albany; J. J. Viele, Lansingburgh; Oliver Phelps, Canandaigua.

TRANSPORTATION OF STOCK.

The Committee on this subject reported that arrangements had been made with the different Railroad Companies, whose officers, with their usual liberality, had agreed to transport, *free of charge*, all animals and articles designed for exhibition at the Fair.

Gentlemen who intend to send their stock by the Railroad, must give notice at least one week previous to the Fair, to Luther Tucker, Albany; M. D. Burnet, Syracuse; J. M. Sherwood, Auburn; L. B. Langworthy, Rochester; and L. F. Allen, Buffalo—so that the necessary preparations may be made by the Companies for their transportation.

They farther reported, that extra trains would be run, in which visitors to the Fair will be carried for a sum not exceeding half the usual rates on the roads. Of their times of starting, notice will be given as soon as the arrangements are completed. The Packet Boat Companies have made arrangements to facilitate the conveyance of visitors at reasonable rates.

It is expected that the operations of the Magnetic Telegraph will be exhibited on the grounds during the Fair. It is intended by the proprietors of this work to have it ready for operation from Utica to Little Falls, a distance of twenty miles.

Articles designed for exhibition at the Fair, may be directed to the care of Farwell & Harrington, Utica, who will take charge of them as directed by the owners.

REGULATIONS FOR THE FAIR.

All members of the Society, and all who may become members at the time of the Fair, by the payment of $1, will be furnished with Badges, which will admit the person and his wife and children under twenty-one years of age, to the exhibition at all times during the Fair. Tickets to admit a single person, 12½ cents.

Members will be allowed to enter in carriages with their families, but no hacks or other public conveyances will be permitted to enter, except when the inmates are members of the Society, without paying $1 for each entrance, and the inmates, if not members, to furnish themselves with tickets.

Gentlemen may become members and obtain Badges at the stage-office of J. Butterfield & Co., and at the bookstores of I. Tiffany, G. Tracey, Bennett, Backus & Hawley, Genesee-st., Utica, or at the Business Office at the Show-Yard.

All exhibitors at the Fair must become members of the Society, and have their articles entered at the Business Office before taking them into the enclosure.

All those who intend to compete for the Premiums on Agricultural Implements, Butter and Cheese, Sugar, Cocoons, Silk, &c., should have their specimens on the ground on the 16th, that they may be deposited in their appropriate places, and the rooms suitably arranged on the day previous to the Fair.

No premiums will be paid on animals or articles taken away before the close of the Fair.

Every thing intended for the exhibition, must be on the ground at or before 9 o'clock, on the morning of Wednesday, the 17th.

Animals and other articles offered for exhibition, must be labeled with the owner's name and residence at full length.

THE COMMITTEES TO AWARD PREMIUMS.

The several Committees to award Premiums, are requested to report themselves at the Society's room, at Bagg's Hotel, on Tuesday Evening, the 16th, or at the Business Office on the show-grounds previous to 10 o'clock on Wednesday morning, the 16th, after which all vacancies will be filled, and the Committees will enter upon their duties at 12 o'clock.

The Judges are requested to furnish their awards to the Recording Secretary by 12 o'clock on Thursday, that a list may be made out from which the Treasurer can pay the prizes immediately on the Reports being read from the stand.

The Judges will not award the prizes offered, unless in their opinion the animals or articles exhibited are worthy of the Premiums.

Prize animals and implements at the previous exhibitions, will be allowed to compete for the prizes; but they must receive a higher prize, or in a different class, to entitle them to a Premium. Should the same Premium heretofore given them be awarded, they will receive a Certificate to that effect instead of the prize.

No Viewing Committee, with the exception of the Committee on Discretionary Premiums, shall award any Discretionary Premium, without the previous permission of the Executive Board, expressed through their President.

The Annual Address will be delivered, under the large tent, at 3 o'clock on Thursday afternoon, by Hon. JOSIAH QUINCY, Jr., of Boston.

Immediately after the Address, the Reports of the Committees to award the Premiums will be read, and the Premiums paid at the Treasurer's office. The Treasurer will also be in attendance at the Society's room, at Bagg's Hotel, on Thursday evening and on Friday, for the purpose of paying Premiums.

On Thursday afternoon the Premium animals will be exhibited on the grounds, separate from the others, with cards showing the Premium awarded to each animal, so that the public may have an opportunity of viewing the animals which have been adjudged worthy of the Premiums of the Society.

COMPOSITION OF SOILS.—Now, through the labors of Sprengel chiefly—not solely, for he had predecessors and contemporaries also, though less laborious, and less clear and decided in their opinions than himself—it has been established regarding soils—1. That they all contain a certain proportion of organic, chiefly vegetable matter, which readily burns away when they are heated to redness in the air. This combustible matter in peaty soils sometimes amounts to 50 or 60 per cent. of the whole weight; while in clay soils, such as the white undrained clays of Lanarkshire, less than one per cent is present. 2. That in all naturally fertile soils, the incombustible part contains a notable quantity of each of 10 or 11 different mineral substances. 3. That soils in which one or more of these substances is either wholly wanting, or is not present in sufficient quantity, will not produce good crops. 4. That to these latter soils what is wanting may be artificially added, and that thus their fertility may be increased, restored, or maintained. 5. That some of these substances, when present in excess in the soil, become noxious to the plant; and that, to render such a soil productive, this excess must be, in some way or other, removed. These five propositions comprehend nearly all that is of importance, in regard to the incombustible part of the soil. They are all fully and frequently stated in the works of Sprengel. They are illustrated and enforced in these of Liebig and Johnston. It would interfere with our present purpose to dwell upon the combustible or organic part of the soil. But, with the aid of these propositions, the general doctrine of soils, and the action of saline or mineral manures, becomes so far clear and simple. A soil, to be fertile, must contain 10 or 11 known substances. If any of these be altogether absent, you will improve your soil by adding them to it; if they are present, the addition of them will do no good. If salt, or gypsum, for example, or the ingredients of wood ashes, be wholly absent, you will obtain large crops by adding these substances largely to the soil; if they are merely deficient, a smaller application will be of service; if they are already present in sufficient quantity, any application of them to the soil will be so much money thrown away.

[Edinburgh Review, Jan. 1845.

GUANO.—Have any of your correspondents, in their experience with this, found it to have any influence on the scent of flowers? I have used Potter's Liquid Guano about once a week, to Pelargoniums and the more choice of the tea-scented Roses. The foliage and flowers have been most luxuriant in their appearance; but the fragrance of the rose seems, in some instances, to have been changed even to a most unpleasant odor. Can that arise from the use of Guano? [English paper.

ORATION

DELIVERED BEFORE THE

AGRICULTURAL AND MECHANICS' ASSOCIATION OF LOUISIANA,

ON THE TWELFTH OF MAY, MDCCCXLV.....BY JUDGE P. A. ROST.

Mr. President and Gentlemen of the Agricultural and Mechanics' Association—

In rising to perform the duty which it has been your pleasure to assign to me on this interesting occasion, I am aware that you do not expect from me an academical discourse upon the importance and the dignity of Agriculture.—Planting is not carried on with rhetoric, and if our occupations be worthy of praise, it is in good taste to let others speak it. You want facts, careful observations, and practical results. You are in search of knowledge. I am bound to say that I have little to impart, but I am willing to converse with you on the subject of our common pursuits; to direct you to the sources from which I derive the limited information I possess, and to state the experiments by which I have attempted to apply that information to the Agriculture of Louisiana, and the manufacture of its products. I do not, however, desire you to take my results as rules of action, till you have verified them, and if I can succeed in awakening a spirit of inquiry which will induce you to do so, their accuracy is of no consequence; the discovery that I was in error will be as useful to you, as the certainty that I was not.

In a paper which I had the honor to contribute to the labors of the Association, last year, I stated that the modern improvements in Agriculture were the result of recent and more accurate knowledge on draining, plowing, manuring, and interchange of crops. I then gave a description of the process of thorough draining as practised in Great Britain, and of subsoil-plowing, which is the complement of it. It is unnecessary to revert to the subject here, except for the purpose of stating that this process is being rapidly introduced in the British West Indies, and that it has proved as beneficial there as in Europe; so much so, that, although by the present modes of cultivation, the average of rattoons and plants is seldom two thousand pounds of sugar per acre, it is confidently believed that, in lands thoroughly drained and sub-soiled, the average will be five thousand pounds per acre. I have no doubt of it, and when that system is introduced here, the produce of a depth of sixteen inches of dry alluvial soil cannot be predicted; nobody knows to what size cane may be made to grow, and how much sugar it can yield. But, Sir, the process is expensive and can only be introduced gradually. We must for the present go on with our open drains, and we can do passably well with them, provided we have them not over one hundred feet apart, and not less than three feet in depth; with such drains, made or thoroughly cleaned when the land is planted in corn, the hardest clays, if not too low, will be found in the subsequent years to drain as well, to plow as deep and to pulverize as fine as light soils; they will, moreover, yield greater returns in sugar.

Connected with the subject of draining, is that of draining swamps and low lands, so as to render them fit for cultivation, a subject of high importance, since, besides the vast quantity of public lands of that description in Louisiana, there are few plantations on which the proportion of these lands is not greater than that of the cultivated fields. Some abortive attempts at draining low lands had before been made, but within the last year, a few intelligent planters below New-Orleans have taken the lead in good earnest. Their draining machines are the most perfect of the kind, and they have succeeded in obtaining solid foundations for their locks. After the heaviest rains, they dry their land in an incredibly short space of time, and their crops of corn are now growing in marshes below the level of the tides. Their success establishes the fact that the low lands may be effectually drained in large tracts, at an outlay which, with the Congress price of those lands, would not exceed fifteen dollars per superficial acre.

The food of plants and their modes of existence form the subject of a very remarkable work, that of Justus Liebig, upon organic chemistry applied to Agriculture. Others before him had submitted to analysis trees, plants and the earths in which they grow. Countless results of isolated experiments had been collected, but they were rather perplexing than practically useful, till the master mind of Liebig constructed out of them a rational and simple theory of vegetable life. He had not all the facts necessary to make his theory perfect; he was not aware, for instance, of the action of galvanism and electricity upon growing plants. But he did for Agriculture what Lavoisier had done for chemistry; he systematized what was known, and pointed out to his successors the true path of discovery.—Taking for granted that the substances which are invariably found in a plant, are necessary to its perfect development, he has shown which of those substances were supplied by the earth, by the atmosphere and by rain-water; he has proved that pure vegetable mould, which has been considered as the only agent of vegetation, had in it but a secondary and not an indispensable agency, and that the results assigned to it were produced by carbonic acid, water, and ammonia, or rather nitrogen, and certain mineral salts which the earth supplies; he has discovered that in sugar-bearing plants, carbonic acid is the source of saccharine matter. I cannot enter into a detailed examination of this author's views, but I will attempt to show you some of the results to which his theory would lead in the cultivation of the cane, and you will be pleased to find that the practice of our good planters fulfils all the essential requisites of science.

Sugar-cane, analyzed with great care and in various seasons by Mr. Avequin, a person fully competent to the task, is found to contain in pro-

portions, not material to the present inquiry, the following substances, which, according to Liebig, are supplied exclusively by the earth, acetate of potash, phosphate of lime, silica, sulphate of potash, phosphate of potash, chloride of potassium, acetate of lime. These, as well as carbonic acid, ammonia and nitrogen, are hard names, names new to most of us; we must learn their import. Twenty-five years ago we knew not the meaning of piston and cylinder, of steam-chest and safety-valve. We all know it now; and as the application of steam to the mechanical arts has not wrought a greater change than the recent discoveries in Agriculture are destined to effect, we will have to sharpen our intellects once more and raise them to the level of the times. Upon this, however, I do not at present insist, and if you are disposed to be very obstinate, take the mineral salts I have mentioned, as things which, being invariably found in the cane and never in the atmosphere, or in rain water, should exist in the soil in a state fit for assimilation by plants; your lands must contain in that state, potash, silica, lime, chlorine, phosphoric acid, sulphuric acid and substances yielding ammonia; and should any of these be wanting, they must be supplied by deep plowing or by manure.

As it is well known that cane flourishes equally well on all our alluvial lands, when they are first brought into cultivation, we may assume that all these lands once contained, in a state fit for assimilation, the substances necessary to its growth. There is, therefore, no original deficiency to supply, and wherever the cane has ceased to grow and to rattoon as it once did, it is because those substances have been abstracted from the soil by injudicious cropping.

Knowing the mineral substances which the cane requires, chemists tell us that we might at any time ascertain the deficiencies of our soil, by having it analyzed. The suggestion is plausible, but there is nothing in it; we would be as wise after the analysis as we were before. The learned author already quoted shows that arable lands are the result of the disintegration of rocks during many thousand years: that this process is ever going on at the surface of the earth, and that many thousand years will elapse before it is completed. By this process the alkalies and salts which the earth contains, are gradually set free and rendered fit for assimilation by plants; and when all the substances thus set free have been taken up, plants requiring them will cease to grow in the soil where they are wanting, and yet it will require thousands of years to effect a complete disintegration. The quantity abstracted by the cane in Louisiana, during a cultivation in forty years, must be infinitely small in relation to the quantity yet remaining, and accordingly it is found, where land supposed to be exhausted has been analyzed, that it contains the same elements as the fertile soils adjoining it, or found beneath it, united in very nearly the same proportions. It is not the precise quantity of the different elements contained in our soil, which it imports us to know, but that portion of them which is disintegrated and fit for assimilation; this, I apprehend, chemistry cannot tell us.

If we could every year provide a sufficiency of mixed animal and bagassa manure for all the land we plant, it would be idle to inquire about the deficiencies of the soil, since that manure contains all the requisite substances. But, compelled as we are by the severities of the climate to plant annually a large portion of our crops, we cannot save one-sixth of the quantity of manure required. This should be husbanded with care and placed in rotation on the oldest lands; for the remainder, manure would have to be purchased at an expense which would not be under thirty dollars per acre, and the question naturally presents itself—Is it necessary to incur that expense and the extra labor to which it would give rise? Intelligent planters say that it is not, and science justifies their opinion. If in the lands that have been longest in cultivation, the alkalies fit for assimilation are partially exhausted, it should be remembered that the plow has seldom gone beyond the depth of six or seven inches, and that below that depth is a virgin soil in all respects similar to the original surface soil and deeper than the plow can ever penetrate.—So that if a depth of six inches had yielded a sufficiency of disintegrated alkalies to cane crops during thirty years, there is no reason why the next six inches below should not do the same, provided they can be brought to the surface and kept in good tilth. With the thorough drain system this presents no difficulty, and it can be satisfactorily accomplished with the open drains I have recommended. With those drains, a depth of plowing of ten inches, when the stubble is broken up for corn, will give to the land that cannot be manured, all the substances which the cane requires from the earth but one; it will not give a sufficiency of nitrogen. I stated last year that nitrogen or ammonia could only be supplied in large quantities by manure, and I was not then aware that any but animal manure could effect that object. Further experience and observation have satisfied me that it is supplied in great abundance by a process which has long been followed without any clear conceptions of its mode of action: I mean that of covering the land with peas as early in the summer as the corn crops will permit. One of the advantages of peas as a green crop, is, that they take from the land none of the alkalies which the cane requires, while their powerful system of roots has a tendency to accelerate the disintegration of the soil. But their principal action consists in shading the land, thus preventing the escape of ammonia which the rain water deposits in it, and hastening by shade and humidity the decay going on at the surface and the formation of nitre which ever follows it in warm climates. The leaves and seed of the pea are richer in nitrogen than any other vegetable substance, and the result of their decay is the formation of additional quantities of nitric acid.—The nitre and nitric acid thus formed, as well as the ammonia retained in the soil, yield to the following crop of cane the nitrogen they contain. The method now generally adopted of plowing in the field trash, restores to the rattoons, in a state fit for assimilation, most of the alkalies which the plants took up in their growth; and should more ammonia be wanted, by setting fire to the field trash after a rain, the top part of it is converted into charcoal, which has the power of absorbing ninety times its volume of ammonia. To facilitate this operation, cane ought not to be planted less than six feet apart. What precedes, and with it such frequent movings of the soil as perpetually keep the young plants in an atmosphere of carbonic acid, is the method pursued in Louisiana by all successful planters, and the only material improvements I would suggest to them are those of thorough draining and subsoil-plowing.

There are, however, cheap mineral manures

with which it would be well to try experiments. In hard clay lands, for instance, especially if they are too near the level of the swamp to be plowed deep with advantage, quick lime applied to the corn land at the rate of fifty or sixty bushels to the acre, produces an admirable effect upon the ensuing crops. It is itself one of the substances which the cane requires, and can replace others; aided by a crop of peas it very much increases the quantity of nitre and nitric acid formed at the surface, keeps the land in the finest state of tilth, causes the rapid decay of the inert vegetable substances which accumulate in it during repeated crops of cane, and is thus an abundant source of carbonic acid. Land I limed four years ago was planted again last winter and the cane upon it is the best I have.

Experiments successfully made in Europe induce me to believe that we all have at home a substance possessed of the same qualities as lime, and in a higher degree. That substance is clay when burnt to ashes. I cannot describe the process by which it is prepared; you will find it in a recent publication entitled the "Farmer's Manual." It is sufficient to state that little or no fuel is required, and that one small cart load of the ashes is said to have a better and more lasting effect than eight bushels of lime.—The ammonia which they absorb and retain, more than replaces the nitrification obtained by liming, and the burning disintegrates very large quantities of alkalies. It is to the effect of burning that the inexhaustible fertility of lands formed by the eruption of volcanoes is to be attributed.

Common salt I have also tried with success, at the rate of ten bushels to the acre. It gives to the cane a deep green color, and seems to prevent the growth of grass.

I observed, that covering land with peas caused the formation of nitre. In Europe, nitre and saltpetre are both used upon growing plants, at the rate of about one hundred pounds per acre: it is probable that, sprinkled before the plow, here, when the land is first thrown to the cane, their effect would be similar to that of peas.

Much has of late been said on the subject of Guano, and experiments made in Jamaica prove it to be a valuable manure for cane. Used there at the rate of one pound to every four feet square, or about twenty-seven hundred pounds to the acre, it caused cane to ripen earlier and to yield two hundred pounds more of sugar per acre, than that dressed with common manure. Those who made the experiment seem to think that one-third of the quantity used might have been sufficient. Admitting the fact to be so, and supposing the rattoons to last two years, and to yield an additional quantity of two hundred pounds of sugar per acre, which is not probable, an outlay of nine hundred pounds of Guano would, in the next three years, give an increase of four hundred pounds of sugar. Where other manure has to be purchased, as in Jamaica, and costs more than Guano, this increase of product is a material advantage. But where deep plowing and peas do as well as animal manure, the additional product obtained by the use of Guano would not pay for it. An experiment is now going on with it in my neighborhood; if it should make the cane fit for the mill earlier than it usually is, it would on that account be very valuable. In the mean time, I would recommend the use of it to a portion of my audience whom I have, till now, sadly neglected: to you, Ladies, within your realm of fruits, flowers and shrubs. There, as well as in the garden, when applied with intelligence and care, it does wonders, and I beseech you not to neglect the means it affords you of increasing the beauty and the comforts of your homes. When God, for wise purposes, doomed man to waste his energies in conquering physical obstacles, He placed you near him to cheer him in his weary task, to remind him that his toils had a worthy object on earth, and to recall him in his hours of repose to the consciousness of his moral existence. All about his dwelling that has the spirituality of beauty and grace, is by some mysterious tie connected with you, and you have an interest in its preservation. Nurse your flowers, then, as if they were a part of yourselves, and let your favorite plants have a cheerful and happy look.—Above all, do not torment them into fantastic and unnatural shapes; remember that the God who made them, gave each of them, as he gave each of you, peculiar forms of beauty, which knives and scissors cannot improve, and that trimming should be resorted to exclusively with the view to restore and preserve the natural shape of each species, as you resort to the mysteries of the toilet to make the perfections you possess conceal the slight blemishes which may accompany them.

Although, for want of time and of competent knowledge, I have confined myself to the sugar crop, my observations upon draining, tillage, animal manure and peas, may be considered as applicable to the cultivation of cotton also. I would not recommend any course which would further extend that cultivation; but if the same crops could, as I believe, be obtained from half of the land that now produces it, the other half might be employed in raising provisions and other products, such as indigo, hemp and tobacco.

On the subject of interchange of crops, I have nothing to offer, and I will now direct your attention to the improvements proposed in the manufacture of sugar.

Not less than six new methods have been partially tested and are now offered for our adoption. We ought to be thankful for every effort of that kind, and encourage to a reasonable extent those persons, who, in trying to benefit themselves, desire also to benefit us. But planters cannot be expected to incur the great expense which the adoption of most of those methods requires, till they have satisfactory evidence of their entire success. That evidence is yet wanting; there is in all much room for improvement. The process of my friend, Thomas A. Morgan, of Plaquemines, is thus far considered the best, and he is far from claiming perfection for it. The increase in the quantity of sugar obtained by some of the innovators, is principally owing to the fact that they re-boil the molasses. This is done equally well by others in open pans.

A new apparatus, said to embrace all that has been found valuable in the others, is now being constructed at the Novelty Iron Works, in New-York, for Mr. Valcour Aime, of St. James, a gentleman distinguished for his enterprise, as well as for his practical knowledge of the subject.—It may do better than the others, but, Sir, all these new methods have the original fault of the usual process, their authors begin wrong. They commence by creating large quantities of coloring matter in the juice, and then, by a great variety of means, they endeavor to extract that coloring matter first from the syrup, and afterwards from the sugar, and in this, by-the-bye, no-

body has yet effectually succeeded. Let me explain my meaning:

If you cut in two a sugar cane and examine the interior part of it with a magnifying glass, you perceive the crystals of sugar as distinct and as white as those of double refined sugar. The object of the operator should be then either to extract those crystals without altering their color, or, if that be found impracticable, to separate them from the impurities mixed with them, while the juice is in its natural state, and yet contains but little c ring matter. Instead of this, the juice is li , whi'e all the impurities are in it. In separating the feculencies from the juice and uniting them in large flakes, lime dissolves a portion of them and forms with them coloring matter which, we all know, at once discolors the juice, when lime is used in excess. Afterwards heat is applied, either in clarifiers* or in the *grande*;† but most of the impurities found in the juice will decompose and burn at a degree of heat far below the boiling point, say at a hundred and twenty degrees of Fahrenheit. This is shown by the thick scales continually forming in the *grande*. From that degree of heat the decomposition goes on in the clarifier, till the juice is drawn, and continues in the *grande* so long as there are feculencies left.—This decomposition greatly increases the quantity of coloring matter, so that, as the juice is being clarified, it loses in color what it gains in purity: and here, let me show the relative value of the *grande* and of clarifiers as agents of clarification. In the *grande*, if it is well attended to, the skummings are taken up as fast as they rise. A portion of them is removed before they begin to decompose, and the process goes on, so that, before the juice reaches the boiling point, nearly all the feculencies are removed and the source of coloring matter is removed with them.

Clarifiers reach the boiling point much quicker and cannot easily be skummed. The general practice is, to bring them to that point without skumming; to let the feculencies separate from the juice by cooling and by rest, and to wash out the clarifiers every second or third time they are filled. Heat and alkalies acting in them upon the accumulated feculencies of one, two, or three charges, dissolve a much larger portion of those feculencies than they can possibly do in the *grande*; the formation of coloring matter continues during the time of rest, and, accordingly, planters, after repeated trials, generally agree that juice well clarified in the *grande* has a brighter and a lighter color, and makes better sugar than that obtained from clarifiers.

But to return to my subject, the first object of research should be, to find means of clarifying the juice, without creating coloring matter. It is said that presses, something like those used to repress cotton here, have lately been successfully employed in the West Indies, instead of rollers; that the juice obtained is much purer, and that a much larger quantity of it is extracted from the cane. If so, this will be a great improvement, and the first step of the process I would recommend. From juice thus obtained, or even from our own, I have no doubt that all impurities less soluble than itself, may be separated by mechanical means, before heat and alkalies are applied, or at least with a very small quantity of alkalies. All other liquids, all fatty substances and oils, except cotton seed oil, are clarified by very rapid process. Cane juice can no doubt be clarified by similar means, and if this was accomplished, the process of sugar making would be very much simplified. The clarified juice might then be placed in an open evaporator, heated by the waste steam of the engine; then be limed and skimmed if necessary, and concentrated to fifteen or sixteen degrees of the *pese sirop*; then purified by filtration through animal charcoal, if white sugar was wanted, or by rest for other qualities, and finally concentrated in vacuum pans of great power, such pans as Mr. Thomas A. Morgan now uses and which he tells me can only be made in America.

The superiority of the vacuum pan is not universally admitted, and we are told that in France it is superseded by open pans, similar in construction to those called here Mape's Evaporators. However this may be, I cannot help believing that the vacuum pan has many decided advantages over all others; one is manifest; the sugar may be grained in the pan, and the granulation is completely under the control of the operator. He may accelerate or retard it at pleasure, he may carry it so far that sugar will not run from the pan, and will have to be taken out of it; he may so conduct the operation as to increase almost at will, the size and hardness of the crystals. This last is an indispensable requisite, if the practice of draining sugar in pneumatic pans should be adopted. The atmospheric pressure is much too powerful for sugars boiled in any other manner; it breaks and destroys the crystals, and in a very few days sets the sugar to fermenting.

The pneumatic draining of sugar has many things to recommend it; the usual loss by drainage is avoided, sugar is got ready for market day-by-day, as it is made, and it may be bleached by pouring white syrup over it and forcing it through the mass. It is said that the process is attended with considerable loss in weight; but as all that drains from the pans may be boiled over once or twice, it is not easy to conceive how the loss can occur.

One observation on the subject of our buildings. Houses of unburnt brick are of late much recommended to the working classes at the North, and to the settlers in the prairies, as being cheaper, drier and healthier than those built of brick or stone. On reading the description of those buildings in the excellent Report of the Commissioner of Patents, it struck me that they were substantially the same as the old houses of Louisiana, known by the name of houses *en colombage*. Is it not owing to a change in our mode of building that the present race of our people is not so hardy and as long lived as their ancestors were? In former days no one ever entered one of those ancient houses without finding in it a brace of octogenarians, at least.—With our old houses, old people seem to have disappeared; and to you and me, Sir, who are not quite as young as we have been, it may be of some consequence to ascertain the cause of this phenomenon. I have no doubt it is in a great measure owing to the dampness of our modern dwellings, and though we may not persuade our ladies to return to the primitive architecture which was the pride of their great grandmothers, we may at least adopt it for our laborers, and I will make the trial. The brick houses we have built for the purpose of increas-

* Clarifiers are isolated pans in which the juice is sometimes clarified.

† The *grande* is the evaporator farthest removed from the fire in *Compound* furnaces.

ing their comfort, are the cause of many of the maladies which afflict them.

After reviewing the means placed at our disposal to increase the value of our products and to overcome the disadvantages of climate and the gradual deterioration of the soil, allow me to advert to other disadvantages and dangers which in the opinion of many threaten us with inevitable ruin. Two causes of alarm now exist amongst a large number of our fellow planters: the diminution in the value of our lands which will result from the annexation of Texas, and the destruction of our industry by a reduction of duties on foreign sugars, made before we are in a situation to compete with foreign producers. I am happy to say that I believe we have nothing to fear from either.

A person looking upon the map of America, and perceiving a large portion of Texas south of Louisiana, would naturally suppose that Texas is the better sugar region of the two. But the Louisianian who travels in midwinter through the prairies of that naked land, exposed to the unmitigated fury of North-Westers, soon discovers that he has changed climate, indeed, but that he has not come to regions in which tropical plants love to grow. I have it from a gentleman of undoubted veracity, Mr. John C. Marsh, that he has planted cane five successive years in the neighborhood of Galveston, and that he has never obtained rattoons from it. You may then consider it as a well-authenticated fact, that in Texas, as far south as New-Orleans, cane will not rattoon: the cold of winter destroys the stubble; I do not mean to say that it may not to some extent be cultivated there, but I assert that the competition will be by no means a dangerous one, and that upon trial it will be found that the Red River parishes of this State are better adapted to that cultivation than the greater part of what has been called the sugar region of Texas.

Louisiana must remain the great sugar region of the United States; her climate and her soil are the best, and her geographical position is unrivaled. Reflect, Sir, that almost every hogshead of sugar made here, is shipped without land carriage; that planters can always obtain from New-Orleans, in two or three days, any machinery they want, and that their supplies and their market are both brought to their own door. Compare this situation with that of the Texas planter, and you will admit that there is no room for apprehension.

Among our various schools of politicians, one denies to the General Government the power to protect National Industry against foreign competition, and insists upon a horizontal tariff of duties, or no tariff at all. But that school is not, as I conceive, at the head of our affairs. The power it denies, has been asserted and acted upon by all preceding Administrations, and it is the will of this nation, that it shall continue to be so. The people have a strong instinct of self-preservation; they know the value of our present form of polity, and cannot be seduced into changes. Whether the cry be against the Union, against the Veto, or against the Protection of National Industry, you will see the masses come to the rescue, and uphold the substantive powers of Government. The mental process by which that power first came to be denied, is an instance of what usually occurs when some general principle is first applied to the concerns of nations. Theory at once gives the rule, time and experience alone can supply the exceptions. The French philosophers of the last century had said that all men were born free and equal, and the first act of the rulers of revolutionary France was to take that principle as the base of social organization. But they adopted it without the restraints which alone make it valuable, and crime and anarchy were the results of their oversight. In like manner, other philosophers convinced some of our statesmen that trade should be free; and, regardless of the consequences upon national prosperity, they insist that that freedom must be without restraint.

Their great objection to the Protective system is, that it operates in favor of classes. They overlook the fact that, in their sense of the word, all legislation is class legislation; that, however necessary the protection which Government gives to person or property may be to the country at large, its direct operation is inevitably in favor of classes.

Courts of justice are established and maintained at the public expense for the benefit of those who have law-suits; a class in every community, and happily not a numerous one. The army, during peace, is mostly employed in protecting the class of settlers on the frontiers.—The navigation laws protect the classes of ship owners and ship builders; but this last protection, they say, is necessary to public defence; we must have sailors. What do you want with sailors? To man the navy. What do you want with a navy? Where is the national interest which renders the establishment of a navy necessary? I conceive that England should have a navy for national purposes: she has possessions to protect in all parts of the world, and her rule extends over more than one-half of it. But we are not thus situated. Our Territory is all contiguous, and we scarcely possess half a continent. The United States have no national interest to protect, beyond the range of cannon shot from their shores. Let them fortify the accessible points of the coast, and keep a few steam-frigates at the mouth of their harbors, and they will have accomplished all that the national defence requires. I will probably be told here that commerce must be protected: undoubtedly it must, and for its protection alone the navy is maintained. But the United States are not engaged in commerce in their sovereign capacity; commerce is like sugar-planting, a private pursuit, a class interest. And yet by unanimous consent, not only the ways to the regular markets abroad are lighted and guarded for its benefit, at the public expense and forever, but Government is ready and anxious at all times to incur the expenses attendant upon the opening of new markets in all parts of the world. Not later than last year, how much was spent for that purpose in a mission to China, and a naval armament in the Chinese Seas? And, Sir, if some of the men who took a conspicuous part in sending that mission were told by us, you want new markets, come, we will establish one thousand new sugar plantations in Louisiana and increase the cultivation of those already established; we will create an outlet which will require in the next ten years, in addition to the present consumption of the State, one thousand steam engines, twenty thousand kettles, all from Tennessee; three hundred thousand horses and mules; millions of barrels of provisions, corn and coal, and other things innumerable; it will be the best market during peace, and war will improve it; it will take the produce which other nations won't have; it will not require, as com-

merce does, the perpetual protection of navies, foreign missions and consulates, but it will require for the next ten years a protection not so great in degree, considering the shortness of its duration, but different in kind; it will require that the fiscal regulations of the country remain during that time without any material change. Those men, Sir, would shrink from our proposal, as from a most wicked and damnable heresy. Shall we have to give them up? Will they never consent to carry on the government as it is? Whatever they may say, the question of power is settled as it should be, and when the effect of temporary protection is to secure a permanent national advantage, the right to it is as undeniable as that of merchants to have vessels of war sent to the coast of China; as that of suitors to have courts of justice provided for them.

Free trade is a good thing, Sir, but outlets are good things too. They stand first in the list of our wants, because we must sell before we can purchase. The freedom of trade, like other freedom, has limits beyond which it ceases to be beneficial. It would defeat its object, if it was permitted to interfere with the paramount duty of government, to enlarge by all practicable means, the purchasing power of the productive classes. For the purpose of enlarging that power, new outlets are secured abroad by conquest or by treaty, and those who resort to them are protected by means of embassies, of consulates, of lighthouses, and of naval forces. For the same purpose, outlets are created at home for the existing products, by the introduction of new branches of industry, and these must for a time be protected against foreign competition, by reasonable duties.

The grain and provisions raised upon our soil never can have sufficient outlets abroad; it is, therefore, the business of statesmen to discover the new branches of industry for which the country is prepared, and to convert them by judicious protection into home markets for those superabundant products.

The Western farmers, who every year descend the Mississippi and its tributaries to sell us the surplus of their crops, are on this subject much in advance of our philosophers. They produce a great deal more than they consume, and they have discovered that the cheapest market for them to buy in, is, and ever must be, that which most increases their power to purchase. I bought, not long since, from one of them, one thousand barrels of corn at 72 cents per barrel, and he took in part pay for a year's supply of his family, three hundred pounds of sugar at six cents. He firmly believed that but for the Tariff, he might have obtained the sugar two cents and a half per pound cheaper from Cuba; though when asked how he accounted for the fact that much sugar had been sold here last winter at 2¼ and 2½ cents, he admitted himself to be in, what he termed, a *regular quandary*, but that, he said, was immaterial, for he was aware also, that the Spaniard would not have his corn, and that he could not compel me to grow corn without losing at least one-third of his purchasing power. So that, giving him the full benefit of the absolute free trade doctrines, his account would stand thus: two cents and a half a pound gained on three hundred pounds of sugar; twenty-four cents a barrel lost upon one thousand barrels of corn. That man will never do me harm; he understands our relative position. Let not these be called anti-democratic doctrines; they must be democratic, because they are true. I say that the intelligent protection of new products promotes the general welfare, and admit the expediency of limiting that protection by the necessities of the Treasury; I assert, with Jefferson, that foreign producers have the will and power to prevent the introduction of new branches of industry in our country, and that they must not be permitted to do so. I maintain with Gen. Jackson that a horizontal tariff is not a judicious tariff. Those men and their doctrines are sufficiently democratic for me.

If I were asked what certainty there is that in ten years we will be able to compete with foreign producers, my first answer would be, that after that time we must do so, whether we can or not. Let no act of government check the impulse now given to the cultivation of the cane, and in ten years, more sugar will be made than the United States can consume; when this happens, the surplus will have to meet foreign sugars in the general market of the world; the fiscal regulations will then affect that staple as they now affect cotton and rice, and revenue will have to be raised upon tea and coffee. But, Sir, I do not hesitate to assert that we can be prepared to meet the foreign producers.

There is a strong analogy between the cultivation of the vine in middle France, and that of the cane in Louisiana. During the first centuries of the Christian era, there was no wine produced in France, except Marseilles wine.—More Southern Europe and the Isles of Greece were then the wine-growing regions. In the course of time, the monks of Aquitaine, of Champaign, and of Burgundy, God bless them! transplanted the vine to the shelter of their convent walls. Their efforts were for a long time unsuccessful, but they persevered, and the great saints of those dark ages took a conspicuous part in the good work. At last their grapes attained maturity; they tasted the juice, and said it was good. Wine was subsequently made of it, and it is easy to conceive the joy of those holy men, when Champaign first sparkled on their board, when the vintages of Medoc and Burgundy replaced in their cellars the rough beverages of Provence. The cultivation of the vine continued to increase and to improve, but the increase was so slow that wine was not exported from Bordeaux to foreign countries, till some time in the twelfth century. And now, Sir, the great wine region of the world is that very portion of France, in which the introduction of the vine was the work of centuries.

How is it with the sugar cane in Louisiana? It was introduced here at an early day from the West Indies, and cultivated to a small extent at at Terre aux Bœufs, and in the neighborhood of New-Orleans. Nobody at first imagined that sugar could be made of it. The juice was boiled into syrup, which sold at extravagant prices. In 1796 Mr. Bore, residing a few miles above New-Orleans, a man reputed for his daring and his energy, formed the desperate resolve of making sugar. He increased his cultivation, put up the necessary buildings and machinery, and procured a sugar-maker from the West Indies.—The day appointed for the experiment was come, and the operation was under way. The inhabitants of New-Orleans and of the coast had assembled there in great numbers. But they remained outside of the building at a respectable distance from the sugar-maker, whom they looked upon as a sort of magician. The

first *strike* came, and he said nothing; this they thought fatal, but still they remained fixed to the spot. The second strike was out; the sugar-maker carefully stirred the first, and then advancing toward the assembled crowd, told them with all the gravity of his craft, "Gentlemen, it grains!" "It grains!" was repeated by all.—They rushed in to see the wonder, and when convinced of the fact, scattered in all directions, greeting every body they met, with "It grains!" And from the Balize to the Dubuque, from the Wabash to the Yellow Stone, the great, the all-absorbing news of the colony was, that the juice of the cane had grained in Lower Louisiana. It did grain, it has continued to grain; it has grained the last season, at the rate of two hundred and fifteen millions of pounds, and if no untoward action of government prevents it, in ten years it will grain to the extent of much more than double that quantity. Prepare therefore to meet foreign competition. I tell you we can do so, as well as the wine growers of France, provided we improve the time that is left us, and remain true to the spirit of our national race.

The innate faculty of our people to subdue the physical world, their energy and self-reliance, their habitual disregard of discomfort, difficulties and dangers, have made other nations say of us, that we alone could instil heroism in the common pursuits of life. With heroic determination then, speed the plow; bear in mind that to go ahead without ever taking difficulties into the account, and by that means to succeed when others dare not undertake, is emphatically the AMERICAN SYSTEM.

MANUFACTURE OF MANURE.—I think I may affirm, from what I frequently witness in the mode of making and managing manure, that many do not sufficiently consider the great difference between strong and weak manure, in its fructifying quality, and durable effects in invigorating the land to which it is applied; and this is an important thing for every farmer to well understand. If straw and hay only, without cake or corn, compose the manure that is taken to the land, (and many, to my knowledge, even of those who could well afford to buy them, continue this bad practice,) comparatively it is as sour small beer to a man who has an extraordinary task of labor to perform, and needs the aid of a powerful stimulant to enable him to accomplish it. As the man would fall short under such treatment, so does the land fail in like manner. Now if I can show that the corn given to stock upon a farm, is all returned in extra produce, besides manifold advantages, which your sagacious readers will readily discover, surely all that have the means of entering upon this system will do so. I will take my own business for an example. I shall this winter use 100 quarters of corn upon my stock, exclusive of horses. I calculate the manure I shall make with which this corn is incorporated, will manure well 36 acres, and as my system of farming is three crops and a fallow, three crops will be gathered before the same land will be manured again. I will ask any practical farmer, may I not reasonably calculate upon a quarter of corn per acre more upon each of the three crops, than I might have expected had I put on the same land the same quantity of manure of the weak kind, made from hay and straw alone? Assuming, then, that I get one quarter of corn more in each of the three crops by using the corn, the 36 acres in the three years return 108 quarters extra produce for the 100 expended. Of course it will be obvious to every practical man, that rich manures should not lie in the yard, exposed to the washing of heavy rains, but made principally under cover, and frequently collected into a heap, and well secured until taken to the land, and especial care taken that the fermentation does not become too rapid; to prevent which anything may be mixed when it is put together that is likely to check and cool it. I use sand when I cannot obtain anything better for that purpose, and to cover the heap over to prevent it being weakened by evaporation. A farmer does not require a philosopher or a chemist to inform him wherein the strength of manure consists; he has only to refer to his cattle-stalls, his pig-sty, and dove-cote; it is there seen that the manure that contains the most corn in proportion to other matter composing it, is invariably found to be the strongest and best. [A Farmer, in Bell's Weekly Messenger.

The following facts are worth the consideration of the Members of Clubs:

DESTRUCTION OF SPARROWS AND OTHER BIRDS.—Mr. Bradley, in his general treatise on Husbandry and Gardening, shows that a pair of sparrows during the time they have their young to feed, destroy on an average every week 3,360 caterpillars. The calculation he founded on actual observation, having remarked that the two parents carried to the nest forty caterpillars, &c., &c., in an hour. These birds likewise feed their young with butterflies, and other winged insects, each of which, if not destroyed in this manner, would be the parent of hundreds of caterpillars.—[A correspondent of ours, who has paid much attention to the rearing of butterflies, &c., in order to obtain perfect specimens for an entomological cabinet, had 840 caterpillars hatched from the eggs laid by one female, of this tribe of insects, in the course of a few days.]—A gentleman writing on the use of birds, in the "Horticultural Register," states that the gold-crested wren, willow-wren, or hay-birds, and chiff-chaff, eat insects only. Where they are plentiful, they may be of great use in thinning, on their first appearance, wheat-flies, blue dolphins, hop-flies, and the pea-plant aphides.—This is important, for one of these insects killed on their first appearance will prevent the breeding of thousands. Gardeners are prejudiced against the hay-bird, or cherry-chopper, but it does not taste either cherries or strawberries, but the cherry plant louse, which ravages cherry leaves in April. Nightingales eat insects only; so do the win-chat, the stone-chat, wheat-ear, pippits, and wag-tails. Every means should, therefore, be taken to encourage them to breed, by protecting their nests. The principal insect-eating birds, which partially eat fruits or seeds, are the common wren, house and hedge-sparrows, red-breast, chaffinch, black-cap, garden-warbler, and the greater and lesser white-throats, also the tom-tits. The march-tits eat insects chiefly, but also eat farinaceous seeds, as those of the sun-flower, or peck a bit of ripe pear or apple; but such damage is trifling, and is a reward which should not be grudged, considering the great good which they do both to the farmer and gardener.

COMPARISON OF GUANO WITH OTHER MANURES.

BY DAVID BARCLAY, M. P.

To W. Miles, Esq. M. P.

My Dear Sir: The very extensive use of Guano as a manure, and the prospect of very large supplies from Peru and the West Coast of Africa, induced you to recommend to the Council of our Society that some of its members should undertake to test the relative value of the different kinds, including Potter's artificial Guano, as compared with farm-yard manure; and Humphrey's compound was subsequently proposed to be tried at the same time. I undertook, for one, to make these experiments. We were instructed to sow Skirving's Swede, and to apply 20 tons of farm-yard dung to the acre, 3 cwt. of Guano, and such quantities of Potter's Guano and Humphrey's compound as the proprietors might desire.

The land which I selected for making these experiments is a light, flinty loam, of uniform quality, with a chalk subsoil. Long strips of an acre each were measured with exactness, and admitted of 16 rows of plants in each strip, at the distance of 26 inches between the ridges. Four acres were drilled on the 22d of June; the fifth acre, with Humphrey's compound, was delayed for want of seed till the 26th. Instead, however, of 20 tons of dung, as proposed, only 12 tons were applied; of the African and Peruvian Guano, and of Humphrey's compound, 3 cwt. each; and of Potter's artificial Guano 4 cwt. by his desire: all were mixed with 9 cwt. of ashes, and drilled in with the seed on the Scotch system. The 5 acres were twice hoed. About the middle of January, 1845, 2 entire rows out of the 16 in each strip were raised, trimmed, and weighed, and the weights, multiplied by 8, must have given the weight per acre with accuracy, as, owing to the great length of the rows, no material departure from exact results could take place. The following table will show the cost of each manure, the produce per acre, the value estimated at 15s. per ton, also the cost of each manure, and its application per ton of roots.

The long drought which we experienced will account for the small produce per acre, and may possibly have exercised a greater influence on one description of manure than on another; I cannot, therefore, consider my experiments so decisive of the relative value of the manures as if the season had been more propitious: but should the trials undertaken by others correspond in their results with mine, information will be elicited which may be useful to the agricultural body. It was remarked that the drought appeared to have the most influence on the acre manured with dung, turning the leaves more yellow than on the other strips dressed with Guano; and until the weights convinced us of our mistake, we were under a strong impression that the guanos had beaten the dung. There remains for us to learn the value of these manures upon the succeeding crop of barley, for which purpose the 5 acres will be carefully distinguished, and the produce of each accurately measured.

I remain, sir, yours, &c. &c.,
DAVID BARCLAY.

Eastwick, February 12, 1845.

Account of Experiments *as to the relative Value of Farm-yard Manure, African Guano, Peruvian Guano, Potter's Guano, and Humphrey's Farmers' Compound, conducted on Eastwick Farm, in the County of Surrey.*

No.	Description of Manure.	Quantity used per Imperial Acre.	Cost of Manure, Carriage, and Application.	£ s. d.	Produce of trimmed Swedes per Acre. T. cwt. qr. lb.	Value of Produce at 15s. per Ton. £ s. d.	Cost of Manure and Application per Ton of Swedes. s. d.
1	Farm-yard..	12 Tons.....	At 5s.	3 0 0	9 7 3 20	7 1 0	9 4
			Carriage, ...	1 4 0			
			Spreading,...	0 4 0			
				4 8 0			
2	African Guano...	3 Cwt..	At 6*l.* 10*s.* per ton,..	0 19 6	8 2 0 0	6 1 6	2 8½
			Sowing,....	0 2 0			
				1 1 6			
3	Peruvian Guano..	3 Cwt..	At 10*l.* 10*s.*...	1 11 6	8 0 0 0	6 0 0	4 2½
			Sowing, ...	0 2 0			
				1 13 6			
4	Potter's Guano...	4 Cwt..	At 12*l.*.....	2 8 0	8 17 2 8	6 13 2	5 7½
			Sowing, ...	0 2 0			
				2 10 0			
5	Humphrey's Farmers' Compound.....	3 Cwt.	At 12*l.*, ...	1 16 0	5 17 3 0	4 8 3¾	6 6
			Sowing, ...	0 2 0			
				1 18 0			

ON THE MISMANAGEMENT OF STABLE-DUNG MANURE, ESPECIALLY AS REGARDS EXPOSURE TO RAIN.—Whilst, at a vast expense, the farmer is importing bones from the shores of the Black Sea, nitrate of soda from South America, guano from the coast of Peru and from the African coast, he is, in too many instances, negligent of the manure that his stable and stalls supply. This negligence has been pointed out, and emphatically dwelt on, by every recent writer of authority on Agriculture. As regards exposure to rain, and the injurious effects of it on the kind of manure just alluded to, examples of it, in this part of England (Westmoreland), where an unusual quantity of rain falls, are of every-day occurrence, and almost every where to be met with: the instances of neglect constitute the rule; of care and attention, the rare exception to the rule. The farm-steadings here are commonly on declivities; the dung-heap is usually placed on a declivity, often by the side of a road, and, in consequence, after every shower of rain, the water that runs off, percolating through the manure, robs it of some of its most valuable ingredients, especially its soluble salts, and soluble animal and vegetable matter, tending to starve the fields and pollute the roads. I have had the curiosity to collect portions of such drainage, and subject them to examination; and I now propose to give the results, as they show, in a very marked manner, the injurious effect, and how great is the loss to the farmer in consequence. The first portion collected was from a heap of stable-dung, fresh from the stable just before a heavy fall of rain, the accompaniment of a thunder-storm, nearly an inch falling in three hours. The water which ran from the dung-heap was of the color of a weak infusion of coffee, of sp. gr. 1002, to pure water as 1000. With the peculiar smell of stable-dung, it had a just perceptible smell of ammonia, which was rendered more distinct by the addition of lime. Under the microscope, it was found to contain, besides a fine granular matter, and many minute vegetable fibres and scales, particles resembling grains of pollen, and two or three different kinds of animalcules. Evaporated to dryness, it yielded 2·6 per 1000 of brown matter, which partially deliquesced on exposure to a moist atmosphere; emitted a very faint smell of ammonia when mixed with lime, indicating that in the process of evaporation, most of the ammoniacal salt had been expelled, and was therefore carbonate of ammonia; and when incinerated afforded as much as 51·6 per cent of grey ash—48·4 per cent. of the extract having been destroyed by the fire, which may be considered as animal and vegetable matter. The ash was found to contain the sulphuric, phosphoric, and carbonic acids, and chlorine, with potash, soda, lime, and magnesia, chiefly in the form, it may be inferred, of carbonate of potash, phosphate of lime, sulphate of lime, sulphate of magnesia, and common salt. The proportional quantity of the sulphate of lime was large, as was also that of the fixed alkaline salts, whilst that of the phosphate of lime and the magnesian salt was small. The next specimen examined was from a much larger and older dung-heap, after a fall of 1·12 inch of rain in about 12 hours. The fluid was of a darker brown than the preceding, very similar in its appearance under the microscope, of higher sp. gr., viz: 1008, and yet less rich in ammoniacal salts, for when mixed with lime, it gave only a very faint smell of ammonia; and its extract obtained by evaporation, when mixed with lime, had no smell of the volatile alkali. It yielded, on evaporation, 10·4 per 1000 solid matter, similar generally to that obtained from the first portion in its qualities, abounding, in like manner, in salts, and those of the same description. The third specimen collected for examination was from the same dung-heap, after a fall of 2·79 inches of rain, in 24 hours. It differed so little from the preceding, that it is not necessary to describe it particularly. As might have been expected, it was more dilute, its sp. gr. being 1004. The last specimen I shall notice was one procured from the same dung-heap, after four days of dry weather following the heavy rain last mentioned. It was oozing out slowly in small quantity; was of a dark brown hue, nearly transparent, and almost destitute of smell. Under the microscope it exhibited a few particles and fibres, a very few minute crystals, without any animalcules. I had expected to have found it a concentrated infusion of the dung-heap, and, as such, of high specific gravity; but it was otherwise; its specific gravity exceeded very little that of the preceding, and was less than that of the second portion, being only 1005, leading to the conclusion that the manure was nearly exhausted of its soluble matter. The weather, during the four days without rain, was comparatively cold for the season (it was in September), with a northerly wind—the thermometer, even by day, below 58°, and at night once or twice approaching the freezing point. This low temperature must have checked or put a stop to fermentation, which, in its turn, might have prevented the further formation of soluble matter. The infusion mixed with lime indicated the presence of ammoniacal salts; it emitted a pretty strong smell of ammonia; and, judging from the effects of other reagents, its composition was very similar to that of the preceding portions; it probably contained a larger proportion of vegetable matter, humus and humic acid, than the earlier drainings; it gave a very copious precipitate with the acetate of lead. The bearing and application of these results hardly require to be pointed out. As the drainage of the dung-heap exposed to rain contains some of the best—the chief ingredients of active manure, (excepting always the insoluble phosphates,) it follows, that the more the dung is exposed—the more it is subjected to the washing and percolation of rain-water—the greater must be its loss, the poorer and more exhausted it must become; and that shelter from rain is essential as a prevention; such a shelter as can only be well secured by a shed, under which the manure, if too dry, may be watered with the liquid that may have run from it, received into a tank; and be subjected to such treatment, from admixture or otherwise, as has been found by experience likely to render it more efficient. These results, moreover, I need hardly remark, are perfectly in accordance with the experience of intelligent farmers, in many instances on record, of the extraordinary fertilizing effects of irrigation with water—the washings and drainage of the farm-yard and dung-heap.

[John Davy, M. D. in the Edin. Phil. Journal.—The Oaks, Ambleside, Oct. 12, 1844.

MANURE FOR ONIONS.—For the information of "J. C. C.," of Exeter (p. 225), I beg to say that last year I had one of the finest crops of Onions I ever saw; they were cultivated as fol-

lows:—The ground (which is a stiff loam on the lower oolite), was ridged up before winter. In the middle of March the ridges were levelled, and about 3 inches in thickness of compost was spread and pointed in so shallow as to be only barely covered with earth. The seed was immediately afterwards sown in drills 9 inches apart, and between every five rows was an alley 18 inches in width. Waterings were frequently applied during the early growth of the crop; and it was twice watered with water in which guano was dissolved. The compost consisted of about one-third well-rotted old hot-bed dung, one-third old night-soil, and the remainder of wood-ashes, and black woollen manure from a clothing factory in equal quantities; the latter contained a considerable quantity of oil. The whole had been well mixed together some months before it was applied. [Cultor.

From the London Gardeners' Chron. June 21, 1845.

ENTOMOLOGY.—*The Cockroach, or Black-Beetle (Blatta orientalis).*—This too well-known insect sometimes overruns dwelling-houses, warehouses, mills, and bakehouses, and even ships at sea, to an extent which renders them almost untenable. The same species which infests our habitations is also a complete pest in Russia and Finland, and has made its way thence into Sweden. The Cockroaches are very active creatures, and being nocturnal, exceedingly voracious, omnivorous, and endowed with a surprising fecundity, they become a great annoyance where they take up their quarters. When in excess, their scent is very sickly and disagreeable, and besides defiling whatever they touch in the kitchen or larder, they will nibble the leather of boots and shoes, the binding of books, and even wearing apparel, especially if they be old and dirty. The casks of biscuits and cheese on board ships, are greatly injured by the inroads of these vermin: this, however, is frequently the work of another species, the B. Americana, which is fortunately confined at present to the storehouses along the banks of the Thames; and a smaller species named B. lapponica* is equally destructive.—Even man is not secure in his person from their assaults, for in the West Indies the larger species have been known to eat the toes and fingers to the quick during the period of sleep, and after death they will prey upon the human body like vultures, as may be seen when the charnel-houses at Naples are opened for the daily reception of the dead!

It is undeniable that Cockroaches delight in warmth, preferring kitchen grates, bakers' offices, mills, &c., and we never meet with them during the Winter or cold months of Spring, and although it is impossible to ascertain from what country the B. orientalis was first imported, it no doubt has been migrating from a hotter climate than our own; in all probability it came from the East, and such seems to have been the opinion of Linnæus, from the name he assigned to it. Cockroaches also detest the light, and for that reason we seldom see them in the day time, and as soon as a candle is introduced into a dark kitchen, they scamper off into holes and crevices to hide themselves.

The males have wings, of which the females are destitute; indeed they do not require them, as their province is to rear their young: their bodies, moreover, are often so large and heavy that they would stand in need of much more ample organs of flight than their male companions, which cannot often use them, for I never saw one flying. The females are frequently seen moving about with a large oval mass of eggs, as represented at fig. 1, it is said sometimes for a week, until they can find a convenient spot to deposit them: this leathery case (fig. 2) is of a pitchy color, with a sharp serrated ridge along the back, consisting of 16 points, and on dividing one of these bags longitudinally, it will be found to contain about the same number of elliptical cells (fig. 3); each of these produces a young Cockroach, which is able to run about as soon as it issues from the egg through the serrated suture, which splits for that purpose, and from that time to its death it is feeding, growing, and passing through its different stages of larva, pupa, and imago, with very little change of aspect compared with most of the other orders of insects.

Blatta orientalis is of a deep shining chestnut brown; the orbicular head is bent down and concealed beneath the thoracic shield; the mouth is furnished with an upper and under lip, two strong-toothed jaws, and four feelers*; the eyes are kidney shaped, and excessively finely reticulated, and close to the inner margin is an ochreous membranous spot; the antennæ are like two pubescent bristles, as long as the animal, composed of numerous joints, and inserted in little cavities close to the inner margin of the eyes; the thorax forms a large shield, somewhat triangular, with the angles rounded; in the males

* Curtis's Brit. Ent., fol. & pl. 556.

* Curtis's Brit. Ent., fol. & pl. 256.

(fig. 4) there is an incurved indentation on each side of the disc with a ferruginous line down the center; the scutellum is broad and undefined; the elytra sometimes extend almost to the apex of the abdomen; they are coriaceous, elliptical, and rough, with numerous nervures, the inner edge of one lying over the other in repose, beneath these are folded the wings, which are often shorter, membraneous, with numerous branching nervures, and reticulated; the abdomen is depressed, elongate-ovate, and composed of eight segments; from the base of the last arise on each side two spear-shaped processes, formed of short joints, and to the under side of the same are attached two slender curved appendages; the six legs are strong and longish, the coxæ and thighs are stout; the tibiæ are spiny; the tarsi are more slender and five-jointed, the basal joint being long, the fourth minute, and the fifth terminated by two curved sharp claws. The female (fig. 1) is generally larger, and the thorax smoother; instead of wings there is only a rudimentary elytron on each, with two broad thoracic segments between them; the abdomen is more elliptical before the egg-bag is excluded, and although it has the jointed appendages at the apex, the two little thread-like ones are wanting, and this at once distinguishes the sexes.

The female is very similar to the pupa, and indeed it seems to remain in that state, except that it has the little elytra, which are altogether wanting, I believe, in the pupæ. I may state that the egg-bags often have a hole on one side from which a parasitic fly had issued, called Evania, which possibly we may treat of hereafter.

Of all the remedies, a hedgehog, I know, from my own observations, is the most efficacious, and wool or tow dipped in spirits of turpentine and thrust into their habitations, will kill and expel them, but this unfortunately is attended with danger; sprinkling over by day the spots they frequent would be safer, and probably attended with equal success if persevered in.

[Ruricola.

CHESHIRE CHEESE.

Reflecting on the increase of our export of Cheese to England, and how favorably the best American is said already to compare with the best English article, it might be deemed unreasonable to occupy so much space as is given in this number to the Essay on the making of Cheshire Cheese—inasmuch as it may be supposed that American cheese-makers have little to learn on the subject. But in the first place, we have to consider that the Agricultural Society of the Country where this matter is practically as well, if not better, understood than in any other in the world, has indicated its belief that there was yet room for observation and improvement, by offering a premium for the best Essay; and then, it is not to be forgotten, that according to the fixed rules of competition for all the prizes of that Society, all information contained in prize Essays, must be founded on *experience or observation*, and not on simple reference to books or other sources.—Furthermore, the Society is not bound to award the prize at all, if the Essay, though the best offered, may not in itself be deemed worthy of it. Thus we have a strong guaranty as well for the need, as for the merit, of the Essay in this case.

Is it not a little remarkable, that the knowledge and the habit of cheese-making should have been confined, almost without variation, since the first settlement of the country, as far as we are advised, to a particular part of the United States; and that in adjoining States the people should remain in total ignorance of the process from beginning to end—ignorance so total and profound, that we apprehend some young men, who ought to be familiar at least with the theory of all such subjects, will here for the first time read, in a way to have impressed on their memories, *even the exact meaning of the word rennet?*

In all the State of Maryland, within the recollection of the writer, there has been, time out of mind, but *one cheese maker*—and but one *raiser* or cultivator of *pea-nuts*, or ground peas. These men were as remarkable in their day and generation as Izaak Walton among fishermen in times past, and Mr. Wilder of Boston among gentlemen-fruiterers and florists at the present day. Both those characters, so distinguished, each in his line, have gone the way of all flesh, which Scripture saith is but "grass," and with them have passed, into utter desuetude, their respective occupations. One was Mr. Sproston, a respected farmer of Cecil county, Maryland, who, in possessing the mystery of cheese-making, was regarded with a degree of superstitious respect, as a sort of necromancer. The other character was an old gray-headed, gray-bearded *African born negro*, who, by some chance, tradition saith not how, got, solitary and alone of his race, into Calvert county. To him was yielded

implicitly the monopoly of pea-nut—or "*peander*" making, as it was vulgarly called. If any one knew his process they dared not imitate it—"Old Mawney," as he was called and known throughout the county, could barely contrive to make himself understood in a sort of broken English—which being engrafted on the African tongue rather late in life, never grew well.—Mawney's great staple and support through life was his *pea-nut crop*, with which he traveled usually on Saturdays round the county, carrying his bag on his back and selling its precious contents by the quart. Every boy of that ilk lived in awful respect of "Old Mawney," the more because "he came from Guinea," and would have as soon entered the cave of Polyphemus as to have approached Mawney's hut alone—with them, like Bethlehem Gabor, the misanthrope in the novel. he carried about him an atmosphere of mysterious potency for evil beyond which no urchin ever dared to penetrate. Gentle reader; excuse this episode into which schoolboy recollections have drawn us. Who that has a heart in his bosom is not liable to be sometimes seized and run away with by such associations—who so stedfast that is not sometimes carried back in imagination so vividly as to believe himself with some chosen school-companion mounting his rod and knotting his line, or watching to bring down the merry squirrel from the hickory-nut tree, or tracking the poor rabbit to his form in the snow? Who would not join again and forever remain among his school-companions?

> "Gay hope was theirs, by fancy fed,
> Less pleasing when possessed;
> The tear forgot, as soon as shed,
> The sunshine of the breast."

Well, we dare say some readers would as soon have us proceed with the *ode* as with the *essay*. What we have said has been to show how it is that we suppose all the world may not know quite all about cheese-making; and now *revenons a nos moutons*.

We have already shown, from Hunt's Merchants' Magazine, how the export of American Cheese to England had increased from 14,000 pounds in 1842, to 53,000 in 1844, and there is reason to believe that the export of 1845 will go up to 100,000, and that without any alteration in the British tariff to encourage it. But wno does not know that the avenue to profit must be utterly inaccessible that is not penetrated by Yankee enterprise? See Willis' letter, in which he speaks of Wenham, Massachusetts, *ice* being hawked about the streets of London in carts nicely painted and labeled "WENHAM ICE."—How, but by such extraordinary sagacity and industry, could such a population be kept out of debt and thriving, with a soil so rocky and a climate so cold?

The dairy produce is consolidated in the last census under that one head, no distinction being made between butter and cheese any more than between horses and mules. The whole amount is set down at the value of $33,787,008. Of this amount much more than two-thirds is produced East of the Chesapeake, including Pennsylvania.

This branch of British agricultural industry is protected by a duty of 10*s*. 6*d*. (say $2 62½) per hundred on all Cheese imported from foreign countries, and 2*s*. 6*d*. (or 62½ cents) on that which is imported from British possessions. We dare not take room here to go into the remarks which the subject invites, on the influence which herbage and the treatment of the cows exercise on the products of the dairy, but let the reader have patience, all in good time for that. and for practical dissertations on Chilton, Parmesan and other kinds of Cheese. The best Essay on the making of the latter, from A. to Z. is from the pen of Mr. Jefferson, being notes made by him in a dairy in Parma, where he attended closely, and took notes from morning to night, *while he was Minister of the U. S. to France.*

A DETAILED ACCOUNT OF THE MAKING OF CHESHIRE CHEESE. By HENRY WHITE, Land Agent and Surveyor, Warrington....Prize Essay.

IT has sometimes been a matter of dispute amongst Englishmen which particular county or district is the most famous for the making of cheese. I think, if quantity is to be taken into account as well as quality, the decision must be in favor of Cheshire, as there cannot be less, upon a moderate calculation, than 12,000 tons made in that county annually; a considerable portion of which is of excellent quality.

There is reason for believing that cheese has been made in Cheshire for at least 700 years:* and, from allusions made to cheese and to curd in the Old Testament,† it is evident that an article of this nature must have been known and used at a very early period.

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* "The fame of the cheeses of Cheshire is of very ancient date: at least as old as the reign of Henry I. (A. D. 1100). The Countess Constance of Chester, though the wife of Hugh Lupus, the king's first cousin, kept a herd of kine, and made good cheeses, three of which she presented to the Archbishop of Canterbury. Giraldus Cambrensis bears honorable testimony to the excellence of the Cheshire cheeses of the day." (*Bell's Weekly Messenger, Feb.* 22, 1841.) "Poor men eat cheese for hunger, rich for digestion. It seems that the ancient British had no skill in the making thereof, till taught by the Romans, and now the Romans may even learn of us more exactness therein. The county of Chester doth afford the best for quantity and quality; and yet their cows are not (as in other shires) housed in the winter; so that it may seem strange, that the hardiest kine should yield the tenderest cheese. Some essayed in vain to make the like in other places, though hence they fetched both their kine and dairy-maids. It seems they should have fetched their ground too (wherein surely some ocult excellency in this kind), or else so good cheese will not be made. I hear not the like commendation of the butter in this county; and perchance these two commodities are like stars of a different horizon, so that the elevation of the one to eminency is the depression of the other."
[Fuller's Worthies.

† 1 Sam. xvii. 18; 2 Sam. xvii. 29; Job x. 10.

It is scarcely necessary to premise that milk, from which cheese is made, consists of three distinct parts—*cream*, *curd*, and *whey*—into which, by repose, it spontaneously separates; but the process of separating the whey from the other bodies may, as in cheese-making, be accelerated by infusing a small quantity of a simple acid extracted from cured and dried maw-skins,* which have been previously dissolved in warm water. This infusion is commonly called "steep," but more properly *rennet*.

The art of cheese-making consists in the complete extraction of the whey and in the proper compacting and curing of the curd. The richness of the cheese depends upon the quality of the milk, or, in other words, on the proportion of cream which the milk contains. The cheese of Cheshire is professedly made from new milk, or milk from which no cream has been taken.—It is, however, well known, that in many dairies, in the morning before cheese making, a small quantity of cream is skimmed off the previous evening's milk; this cream is either churned by itself, or mixed with whey-cream, by which there is obtained a better quality and greater quantity of (so-called) whey-butter. It may appear singular to some, that any portion of cream should be found in whey, but such is the fact, and the means used in Cheshire for extracting it are very simple *(See Appendix.)*

Before entering into a detailed description of the mode employed in Cheshire in the making of cheese, I would remark that this Essay is founded upon my own observations, made during a fifteen years' residence in, and intimate connexion with, that county; which latter is still existing. I have long felt an interest in the subject of cheese-making, with a desire to see it conducted upon more scientific principles, from a conviction that, were such the case, both the pocket of the producer and the stomach of the consumer would often be more agreeably filled: but I do not wish it to be supposed from this remark that I profess myself conversant with these principles: my information being more of a practical nature, and as such I offer it to the Society.

Number of Cows kept, and Produce.—The number of cows kept for the purposes of a cheese *dairy* is seldom less than 8 or 10, or more than 70 or 80; and is of course regulated by the size of the farms—these average about 90 or 100 statute acres, upon each of which about 15 or 18 cows are kept. From 18 cows, a cheese of from 36 lbs. to 54 lbs. weight is made daily during four or five months of the summer.† The annual produce of cheese per cow depends both upon the quality of the animal (with the mode of keeping her) and of the *land*, or rather the *herbage*. I have known many farmers sustain great loss by not feeding their cattle sufficiently well in winter. With judicious management, about 3 cwt. of cheese (of 112 lbs.) may be considered as the average amount made per annum upon land let for 30*s*. [$7 50 annual rent] a statute acre; but in a few instances 5 cwt. per cow, and even more, is sometimes made. This can only be from a small and choice stock.

The Season.—It is the practice amongst farmers in this county to arrange so as to have most of their cows calving in the months of March and April; and so soon as the calves are fed or disposed of, the cheese-making commences, and continues (excepting in small dairies) to nearly the end of the year. In January and February the quantity of milk obtained is often so small that the farmer prefers selling it in the neighboring towns or making it into butter. There are, however, instances, in large dairies (of 70 or 80 cows), of cheese being made throughout the year.

Milking.—The operation commences about five o'clock in the morning, and five or six in the evening. In this county it is the practice for most of the servants, both men and maids, to assist, and for the cows to be milked in the cow-houses (called here "shippons") all the year round. When, as is usual, there is one milker for every six or seven cows, the milking seldom exceeds an hour and a quarter.*

The milk of new-calved cows is not mixed with the other until about four or five days after calving.

Offices and Utensils.—As the evening's milk is seldom made into cheese until the following morning, and sometimes in small dairies (where four "meals" are used) not until the second morning, a cool "milk-house" is necessary; on which account it usually occupies that side of the farm-house least exposed to the sun. The utensils in which the milk is kept are usually portable shallow earthenware vessels called "pan-mugs," and in some dairies leaden or zinc coolers. Most of the milk-rooms have lattice or wire windows for the circulation of air, and the floors are laid in a sloping form for the free escape of the cold water with which they are daily swilled throughout the summer months. If precautions of this nature be not attended to, there is a risk of the evening's milk becoming *sour*; in which case, whatever quantity of new milk be added to it in the morning, the cheese will be *sour* also. I am led to believe that a temperature of as near 50° Fahrenheit as could be maintained, would be best for a milk-house throughout the year.—The *dairy* is generally situate near the milk-house, and fitted up with two *set-pans* or *boilers*†—a large one for scalding the whey, and a smaller one for heating water. The "cheese-presses" and "screw" are kept within this room, and the operation of cheese-making is here carried on. Some farm-houses are not provided with a *dairy*, and the cheese is then made in the *kitchen*—this is commonly the case on small farms. The "salting and drying-house" (often one and the same room), if conveniently situated, adjoins the dairy. The cheese is placed here on stone or wooden benches, salted *externally*, and is afterwards left so as to dry gradually before being removed to the cheese-room. By some dairy-maids, this external salting is dispensed with, and the room is then of

* The *stomachs of sucking calves*. See the method of curing these in the Appendix.

† The Marquess of Cholmondeley and Mr. Tollemache, M. P., with a laudable desire to encourage the suspension of Sunday labor, have, for several years, offered through the South Cheshire Agricultural Society a prize of £20 to such farmer as shall have made the best cheese without infringing on the Sabbath rest. Although this prize has, I believe, been regularly claimed, yet, from a variety of causes, the practice of making cheese on the Sabbath, as on other days, is still very general.

* I was told by an apparently very respectable man, at Saratoga Springs last week, that he knew a New-York farmer, worth more than $200,000, whose daughters milked the cows regularly. [*Ed. F. L.*

† South of New-Jersey, milk-house and dairy are synonymous. [*Ed. F. L.*

course only used for *drying*. These offices are all on the ground-floor. In some cases the cheese-room is over the dairy, in others over the kitchen, or some other room wherein a fire is usually kept, and sometimes, though rarely, over the *cow-houses* or *stables*. Light and air are invariably excluded, either by a curtain or shutters.* The floor is either of plaster (gypsum) or boards, but more commonly the latter; some of the larger cheese-rooms are warmed by stoves, or hot air, and occasionally, though rarely, by fire-places in the room itself. The small cheese-rooms are seldom supplied with artificial heat, except what is gained from the rooms below.—Some cheese-rooms are occasionally found to be in the summer time too warm, in which case the cheese has to be removed for a time to a cooler part of the house. This is more generally necessary where the building is slated, and exposed to the noon-day sun; but is seldom or never experienced where the roof is of thatch. The size of these offices is of course regulated by the extent of the farm; where 30 cows are kept I find them nearly as follows:

	Yds.	Yds.		Sq.Yds.
Milk-house	6 by 3	or about		18
Dairy	6 by 5	"		30
Salting and drying-house.	4 by 5	"		20
Cheese-room over dairy and drying-house	10 by 5	(or 8 by 6)	"	50

The utensils, excepting those I have described, will be noticed hereafter.

PROCESS OF CHEESE-MAKING.—As the first process—namely, that of extracting the whey and salting—occupies, according to circumstances, from five to seven hours, it is found most convenient to commence it in the morning. This being the case, the evening's milk has to be kept all night in the milk-house. In the morning, the cream having been skimmed off, a portion of this milk is warmed. This is done in a circular flat-bottomed brass or tin pan, (see *a*, fig. 4,) floated in the boiler, the water of which has been previously heated for that purpose: the size of this pan is about 20 inches in diameter and 8 inches deep. The quantity to be warmed depends upon the state of the weather; for the first two or three months of the season (say March, April and May) it is not unusual to heat as much as half the evening's milk to a temperature of 100° Fahrenheit, and this heat is rarely exceeded, excepting by those dairymaids who wish to save themselves trouble in the after process. The "cheese-tub," which is similar to a brewing-tub, having been placed in readiness in the dairy, the cold milk is now put in and the warm added. Supposing the temperature of the cold milk to be about 50°, and the warm 100°, and they were in equal proportions, the heat after mixing would be 75°, or something less; but in warm weather it will be sufficient if it reaches 70°. I have known instances of good cheese being made in summer without warming any portion of the evening's milk—indeed, such now is becoming the general practice. In very warm weather some dairy-maids think it necessary to reduce even the temperature of the morning's milk. The *cream*, which is diluted either in about double its quantity of warm or new milk, or by being exposed to the heat of the boiler in the same way as the milk, is next put in. I have before stated that it is customary to retain a small part of the cream for butter: when this is the case, it is considered best to skim it off the whole surface of the cream before diluting, as by that means the froth and bubbles, which are supposed to be prejudicial to the cheese, will, for the most part, be taken off. This leads me to the conclusion that *fixed air*, if it gets mixed in the curd, has been found to be detrimental. Since warming of fluids has a tendency to dispel this fixed air, it is perhaps worthy of consideration whether it would not be better to warm the *whole* of the evening's milk to the required temperature, rather than heating a *part* of it so high as 100°. The process adopted with the evening's milk, as above described, is generally finished previous to the time of milking in the morning; but if not, the dairymaid stops and completes it before the *new* milk is brought in from the cows. This new or morning's milk is then added by passing it through a *sieve* placed upon the "cheese-ladder" over the cheese-tub. When the whole is thus collected, some few bubbles are invariably found floating on the surface; these are skimmed off and passed through the sieve to break them.

One of the most important points now to be attended to is the heat of the milk preparatory to coagulation, as the milk, if at a proper temperature, should now be ready to "set together," that is, to receive the rennet. This heat is rarely tested by any other thermometer than that of the dairymaid's hand; some may, and I have no doubt do, determine it pretty correctly, but cannot always.

In consequence of the changes in the weather it is difficult even for an experienced dairymaid to know at all times what proportion of the evening's milk should be warmed; she is therefore cautious not to warm too much, until the morning's milk is added and the consequent heat ascertained. If it be deemed too cool, a little of the evening's milk which has been reserved is then warmed, so as to produce the heat required; but when none has been reserved, the necessary quantity taken from the tub after the admixture of the two milkings is warmed for that purpose. Little is known amongst the farmers or dairymaids as to the *precise heat* which is best. I have seldom heard the subject named, except by a vague comparison, that such and such dairies were made *colder* or *warmer* than others. I am acquainted with some farmers whose wives are said to have a peculiar method of their own, and who, I believe, obtain a high price for their cheese in the Manchester market, chiefly from the tendency of the cheese to green mould. I know little of the system which these parties adopt, but I understand they make their cheese "cold"—that is, set the milk together at a low temperature; and I am also inclined to think they use less salt than others. I have not solicited the *privilege* of prying into the *mysteries* pursued in these dairies, nor could I expect to have been so indulged if I had, especially if they had supposed it was for publication. It is said these parties get a greater price for their cheese than many of their neighbors, which I have no reason to doubt; and I think, from what I have seen, they make quite as great a quantity per cow. But the *real* price obtained, and the *precise* quantity made in any particular dairy, is seldom known beyond the farmer's own family and the factor.

I ought, perhaps, to state that I have tasted some of these cheeses, and find them generally very good, fair toasters, and without coloring;

* One reason, amongst others, assigned for this (universal) practice, is its tendency to prevent the mischievous effects of the fly.

but in some I have detected a slight sourness: from this cause, or, what is more probable, from too little salt being used, the cheese will not keep long before decomposition takes place.—To the farmer this would only be of consequence in the event of his not being able to sell the article at the time he wished. In the dairies where I have been permitted to take observations, the lowest heat of setting the milk together was 77°. I am disposed to think those who make a so-called *cold cheese* do not adopt much lower temperatures, even in summer, than 74° or 75°; since a much longer time would be occupied in gathering and compacting the curd, and considerable risk incurred of having what is termed a *sour cheese*.

The evening's milk in the tub being at or about 75°, as before stated, and the milk which is brought from the cows 90° or 95°, the temperature of the whole is then found to be somewhere between 80° and 85°; and I am of opinion that the heat at which milk ought to be and is commonly coagulated, ranges between those two temperatures.*

When *coloring* is used, which is not so extensively the case as formerly, it is put into the milk immediately before the rennet. The nature of the article used for this purpose I propose to investigate under a distinct head in the Appendix. The *quantity* of coloring is in some degree regulated by the quality of the milk: if a considerable portion of the cream of the evening's milk has been taken out for making butter, a greater quantity of this coloring matter will be required to give the cheese that appearance which is found necessary to please the *eye* of the consumer, and particularly of those residing in London or at a distance. *Annatto* (or, rather, a coloring matter which *goes by that name*) is the article used; 1 lb. of it for each ton of cheese is a moderate calculation; this would be after the rate of half an ounce to 75 lbs.† The present retail price of the "best *real* Spanish Annatto" is 4s. per lb. The coloring is prepared and applied in different ways, but the most common is to take a piece of the requisite size, to fold it in a small bit of linen, and put it in half or a quarter of a pint of warm water the previous night. By this means it gets sufficiently dissolved. When the infusion is poured into the milk, the linen bag containing it is dipped in, and rubbed betwixt the fingers until the coloring is all discharged. The dregs, if any, remain in the bag.

The *rennet*, or *steep* as it is commonly called, is next added. I have already stated, in the introduction, that this is an infusion made from the preserved stomach or maw of sucking calves, thence called *maw-skins* or *bag-skins*. A recipe for preserving the skins will be found in the Appendix. To define the quantity of rennet sufficient for coagulating a given quantity of milk, is a very difficult matter, as the maw-skins vary so much in quality. When the farmer is laying in a stock for the year, he generally calculates upon a dozen of skins to a ton of cheese; but the skins vary in size, (the price when cured is from 6s. to 9s. per dozen.) In using them, it is the practice often to cut two skins at once. Three square inches taken from the *bottom* (or strongest part) of one, and one or two inches from the top (or weakest part) of the other, is generally found sufficient for sixty gallons of milk. These two pieces of skin are put into a cup containing about half a pint of lukewarm water, with the addition of a tea-spoonful of salt, some part of the day previous to being used. The water thus impregnated with the maw-skin is passed through the sieve into the milk, but the skin itself is generally, though not always, kept out. The rennet-cup is well *scalded* before being used again. I have been told that some farmers make a sufficiently large quantity of rennet to last for several weeks, and find it to answer better than making a small quantity daily. The question is, will it keep *sweet?*

The coloring and rennet having been put in, the milk is well stirred and left to coagulate. It is usual to invert the skimming-dish on the surface of the milk—a practice of doubtful propriety, for this reason, that the curd immediately under it does not attain the same adhesiveness as the other, and is one of the causes of what is commonly called *slip curd*. The tub is now covered up, either with a wooden lid, or with cloths supported by the "cheese ladder;" these assist in preserving the heat of the milk, and protect it from dust and dirt.

The coagulation (or "coming") is generally effected in an hour or an hour and a half. As far as my own observations extend, I am led to think that an average of these two is sufficiently long, if the proper means are used in effecting the formation of the curd: for it is well known that, *cæteris paribus*, the warmer the milk is at the time of setting together, or the stronger the rennet, the sooner will the coagulation take place, but the curd will in consequence be tougher and less in quantity; on the contrary, the cooler the milk, or the weaker the rennet, the longer will the curd be in forming, and the more tender its quality, but its quantity will be greater. By attention to these results the cheese-maker may soon decide when too much or too little rennet has been put in the milk, and correct the quantity the next time. It may be proper here to state that too much rennet has a tendency to impart an unpleasant flavor, or bitterness, to the cheese.

It may generally be expected that the heat of the curd when formed will be four or five degrees less than the milk was when set together; and it is desirable, particularly in cool weather, that this difference should not be greater, otherwise the subsequent labor will be more difficult. To determine exactly when the *curd* is in a fit state for what is called "breaking," requires some practical knowledge; with attention this is soon acquired. The point is generally determined by gently pressing the surface of the milk with the back of the hand, or by lifting up the skimming-dish, beneath which the curd and whey will distinctly appear if the coagulation is complete. Another criterion is the color of the whey, which should be of a pale green.

The "breaking" and "gathering" of the curd

* Since writing the above, I have met with a farmer in Eddisbury Hundred, who says he used the thermometer during the year 1841 for the first time, and that the heat he uniformly adopted was 84°. I also found a thermometer at another dairy near to this, but it was not in use. I was allowed to test the heat of the milk with it, and found it 78°; this was in *June*. The precise heat at which milk ought to be coagulated is a matter of vital importance in cheese-making, and can only be ascertained by a series of careful and judicious experiments made by scientific and practical parties.

† The juice of the yellow carrot and the flower of Marygold are also used for coloring Cheese.

[*Ed. F. L.*

is the next process. This used formerly to be done by means of the hands and skimming-dish (a practice still continued in some dairies); but the *curd-breaker* is now generally made use of for this purpose (see Fig. 1). It is made of wire-work, in an oval form, and has a tin rim round it about an inch and a half broad. This wire-work cuts the curd, by being passed through it perpendicularly *very, very* gently at first, and in different directions, so that the whole mass is separated into very small portions. The length of time required for the operation depends upon the quantity of curd: for a 60 pound cheese the operation often takes twenty or twenty-five minutes. After this the curd is left for a quarter of an hour to separate from the whey, and, if the weather be cool, the tub is covered to retain the heat. The curd having separated, which it does by sinking, a portion of the whey at the top is then taken out by the portable brass or tin pan before alluded to, being *pressed* into it, and emptied into the *set-pan*. The curd is then gently broken by the dairy-maid and her assistant passing their hands down to the bottom of the tub, and buoying up a portion of the curd at each time to the surface, or by again using the curd-breaker. The curd having been brought to the top, is easily seized, and separated into smaller portions, and the whey thereby released. This operation takes about half an hour. After the expiration of another half hour (or so soon as the curd is considered sufficiently settled—for there is no saying to five or ten minutes how long each particular interval of rest should be), more whey is taken out, and the curd afterwards drawn as much into one half of the bottom of the tub as its loose texture will admit of.* Upon the curd is then placed a semi-circular board adapted to the size of the tub, with a weight of about 30 pound placed upon it. This board is perforated with holes, about half an inch in diameter, to allow the whey to escape through. The tub is now set three or four inches atilt to drain the whey more readily from the curd, and to admit of its being collected and carried off. The skimming-dish is again required to lade out the whey. The whey, on its way to the set-pan, is passed through a sieve, to collect any curd which may happen to be floating in it. This curd is what is called *slip curd*, which by some is not returned to the tub, for the reason I have before stated. The weight and board are shortly taken off, and such part of the curd as has been squeezed from under them is again collected on one side, and a heavier weight (say 50 or 60 pound) applied as before. As the whey escapes from the curd it is laded out. In the course of a quarter of an hour the board is again removed, the curd cut in intersections of six or eight inches apart, to assist the discharge of the whey, and the board, with additional weights (about double the last), again applied. Some dairy-maids now add the slip curd. The weights are again increased if it be thought necessary: observing always to *let the pressure which is applied be gradual, and regulated by the degree of compactness of the curd*, for if this is not attended to now, as well as afterwards, a considerable portion of butyraceous matter will be forced out and the cheese of course deteriorated.

The curd is again cut into square pieces, taken out of the cheese-tub and broken a little by the hands as it is passed into the "thrusting-tub" (*a*, Figs. 2 and 3). [In some dairies a large-sized cheese-vat, in others a willow basket is substituted for the thrusting-tub.] In this the extraction of the whey is afterwards continued by the application of "the screw," of which there are two or three kinds, but all on the same principle (see Figs. 2 and 3). The old plan of *thrusting*—and from which the *term* is no doubt derived—was by means of a pole four or five yards long, fixed at one end into an upright post, whilst at the other was seated a lusty lad or a man, who kept regularly pressing down the pole upon the curd, the pole acting as a lever. Both poles and men are now almost entirely expelled from the Cheshire dairies; and the *screw* is also likely to be superseded by the "lever press" (Fig. 5). The advantages of this over the screw are, *that it sinks by its own action with the curd—any degree of pressure required can be applied and gradually increased, and less attention is necessary;* whereas the pressure from the screw is sudden and uncertain, and having no self-action, requires the dairy-maid's assistance every five or ten minutes to render it effectual.

The "thrusting-tub," in which the curd has now to be pressed, is round, and is perforated with holes at the sides and bottom for the whey to escape through (see *a*, Figs. 2 and 3). Before the curd is put in, a "cheese-cloth" of the coarsest kind, about one and a half yard long, and a yard wide, (or of dimensions sufficient to contain the curd), is placed in it.* In this the curd, after being broken, as before stated, is enveloped, and a "sinker," or strong circular board, which fits the inside of the tub, placed on it (*b*, Figs. 2 and 3). Upon this the screw (or lever press, if used) is let down, and the power gradually applied.

To assist still further the discharge of the whey, long iron skewers are introduced through the perforations in the tub, with their points directed upwards, so that when the skewers are withdrawn there is a drain made for the whey to follow. These skewers do not remain in more than five or ten minutes; the pressure is continued a little longer. The curd is now cut *through*, in intersections of two or three inches apart, with a large *dull* knife, so as not to injure the cheese-cloth, and the edge or corner of the curd is cut off all round, and placed in the centre. After this the pressure is again applied, and gradually increased, and the skewers introduced and withdrawn as before, after the lapse of about fifteen or twenty minutes. The curd is then taken completely out of the tub, cut into four or five pieces, and each piece broken separately with the hands to about the size of two or three inches square. A clean dry cloth is made use of, the curd folded in it, and again pressed and skewered. These operations are repeated until the whey is sufficiently extracted to admit of the

* At this stage, it is the practice with some dairy-maids, when they suppose the curd is colder or more tender than it ought to be, to return a few gallons of whey after it has been heated over the boiler in the brass pan into the tub again, to assist the discharge of the remaining whey. If, on the contrary, the curd is found warmer than is intended or desirable, which is sometimes the case in hot weather or during thunder, a few gallons of cold water are applied to prevent the curd becoming tough. These inconveniences would, in my opinion, seldom if ever happen if a thermometer was used at first, and the proper heat at that time adhered to.

* *Cheese-cloths* are *linen*, of a rather closer texture than canvass, and made for the purpose. The coarse kind are sometimes termed *screw-cloths*.

curd being *salted*, which is the next part of the process.

If the milk is set together at six o'clock, and the coagulation takes place in an hour and a quarter, the breaking, gathering, and preparation for salting is generally accomplished by eleven or twelve o'clock.

This is merely mentioned as some guide to the *new beginner*, who may not be able to judge from the state of the curd when it is fit for salting. I may here observe that it is the practice in some dairies to salt the curd, whilst, in my opinion, there is *too much whey in it*.

The *quantity of salt* used is regulated by some old custom, or by the fancy or taste of the dairy-maid, and with about as good a chance of correctness as that with which she regulates the temperature of the milk by the touch. That clever and experienced persons may determine the proper quantity of salt in this way tolerably well, I admit; but there are many others who *fall into error*, and all *for want of some fixed rule*. If there be a certain proportion of salt which would answer the purpose best, which there doubtless is, why not ascertain and adopt it?

"In all dairies" (says Mr. Wedge, the author of the original 'Report of the Agriculture of Cheshire,' written many years ago, but still equally true) "the same points are admitted to be essential, but although the means of obtaining those are, upon farms similarly circumstanced, so far alike, as to differ materially in the minutiæ only, yet upon these minutiæ much of the art of cheese-making depends.

"That an exact uniformity does not prevail in every part of the process, is no wonder; for there is not any of the business which is conducted in a dairy which tends to chemical exactness. Where there is no precision, there can be no just comparison; and where no comparison can be made, there exists no foundation for an attempt at uniformity. *The degree of heat at setting the milk together is never measured, the quantity of steep is guessed at*, and its quality not exactly known; *the quantity of salt necessary is undefined, and the sweating or fermenting of the cheese, when made, is accidental.*"

As an antiseptic, a certain quantity of salt is necessary: it is the same in this respect with cheese as it is with butter or bacon. There may be, and no doubt are, differences of opinion, both amongst makers and consumers of cheese, as to the degree of saltness which is best; and it may be necessary, in order to suit the palates of the *many*, that there should be a *variety*. I am willing to admit the force of the argument, so far, that there might be these shades of difference in different dairies, but think that they ought not to exist in one and the same dairy.—Each maker strives at uniformity as regards the *thickness* and *color* of his cheese, and would like also to attain uniformity in flavor if he could. Why not, therefore, measure or weigh the salt before using; regulating the same by the quantity of milk or the weight or quantity of curd?*

The former would easily be ascertained by means of a *gauge*, or graduated rod, which any farmer might make for himself, to suit his own cheese-tub. The way to make it would be to pour into the tub a gallon of water, or any liquid, and then to note its hight, and mark it on the rod. This being done, put in another gallon and again mark the hight, and so on until the tub is full; taking care afterwards to introduce the rod into the *same part of the tub*, as the bottoms are not often level.

It has generally been considered that a gallon of milk (supposing little or no cream has been taken from it) will produce upon an average of the season one pound of saleable cheese: that is, when the cheese is four or five months old.—In autumn there is always more curd from the same quantity of milk than at any other part of the season.

During wet weather there will sometimes be more milk than usual, though not a proportionately greater quantity of curd. An experienced dairy-maid soon detects these different results, and makes allowances accordingly. I have met with no dairy-maid who regularly weighs the salt; but a highly-respectable farmer, whose wife makes a first-rate cheese, has given me the weight used in his dairy, as near as the same can be *computed*. It is as follows:—

	lb.	lb.	oz.	
In March and April their cheeses average about	30	and ab't	0 10	salt is used.
In May, June and July	70	"	2 0	"
In August	60	"	1 12	"
In September	50	"	1 4	"
In October and Novem'er	30	"	0 10	"

In the above instance it will be seen that more in proportion was used in summer than at other times, and that the average is 1 lb. of salt for 40 lbs. of dried cheese (or say forty gallons of milk).

I was favored with an account from another dairy in which, to oblige me, the salt *for once* was weighed. For a cheese which weighed 46 lbs. a few days after making (say 42 lbs. at four months old) 1 lb. 1 oz. was used. This is also after the rate of 1 lb. of salt for 40 lbs. of dried cheese, and was said to be the quantity uniformly used throughout the year in this dairy, which consisted of about forty cows.

A third account is from a dairy of sixteen cows: the quantity of salt used was generally about 1 lb. for 45 lbs. of cheese; but the dairy-maid made a trial last year with one cheese, using only three-quarters of a pound. The cheese was made at the beginning of June, and when weighed in the middle of September was 42 lbs. This cheese was admitted to be better than the others in the same dairy.*

The salt termed the "middle grained" is the kind generally used; but some use "fine." Before applying it the curd is cut into three or four equal-sized pieces, and each of these is broken into smaller pieces by hand, or is passed *once* through the curd-mill† (fig. 4). The salt is then

* Since writing the above I have learnt that a farmer in South Cheshire, well known for his introduction of improvements in agriculture, has commenced the system of weighing his curd previous to salting it, and he says he uses salt in the proportion of 1 lb. to 42 lbs of curd. He also informs me he sets his milk together by a thermometer, and at a temperature of 76° or 77°.—May, 1845.

* It may not be out of place here to state that at Northwich, which is about the centre of the county, and where the principal salt-works are found, salt is at present bought for 8d. per bushel of 56 lbs. In large quantities the price is considerably lower.

† The *curd-mill* is of recent introduction, and it is only in a few dairies that it is met with; some dairy-maids highly approving, others objecting to it. I think it will soon be more generally adopted, as it effects a saving in time, and breaks the curd more regularly than it can be done by hand.

scattered over it, and the "breaking" continued either by the hands, the curd-mill, or both, until the salt is well intermixed and the curd perfectly crumbled. Each portion as it is broken is put into the cheese-vat, in which has first been placed a clean and rather finer cloth than was used for the previous process, and the curd is compacted as much with the hands as possible, To admit of the curd being properly pressed, it is necessary to put it into such a vat as it will *overfill* by at least two inches. It is also rounded up a little in the middle. The cloth is then brought over it and tucked in at the edges of the vat with a small wooden knife or other dull-edged instrument. In order to support the outside of that part of the curd which is above the vat, and to keep it in proper form when the press is applied, a tin or zinc hoop or "fillet," the edges of which are rounded off so as not to cut the cloth, and the ends lapping over and unattached, so that the same fillet will do for different sizes of cheese, is introduced round the inside of the top of the vat. The "fillet" thus placed sinks with the curd, and having small perforations in it, the emission of the whey is effected through it as through the perforations of the vat. Since it has become the fashion to make Cheshire cheeses *thicker* than they used to be, it is no unusual thing to see fillets six or eight inches broad.

The vat is now again placed under the screw or lever press, and the skewering is also continued. The pressure is increased at intervals, and the skewers inserted in fresh places to accelerate as much as possible the discharge of the remaining whey or "*thrustings*," as it is now termed.

In the course of an hour from the time of salting, the curd is taken from under the screw or lever press and out of the vat, for the purpose of being turned upside down, which is done on a table. In the first place, the angles of that side which was topmost in the vat are cut off; a circular piece, two or three inches deep, is often also scooped out of the centre, and both are broken small with the hands and rounded up in the middle. The cloth being drawn over the curd, the vat is then turned down upon it, and re-turning the vat with the curd in it, the other angles and centre part of the curd are broken in a similar manner: after which the tin fillet is put on, and the screwing and pressing is continued as before for about half an hour or an hour. It will, probably, be two or three o'clock in the afternoon before the curd (or cheese, as it may now be termed) *is got under the press*; that is, when it is removed from the screw to the stone press: but where the lever press is used instead of the screw, which, I think, might always be advantgeously done, all the change that will now be required is a little more weight at the end of the lever.

Before turning the cheese for the purpose of placing it under the press, it is usual to prick it perpendicularly down with a skewer in several places, for the purpose of making drains for the whey, after having been so turned. A clean cloth is applied, and where the lever press is not used the cheese is put under one of the lightest of the other kind. A pressure of six, eight, or ten cwt., according to the size of the cheese, will be sufficient. This is generally accomplished by about two or three o'clock in the afternoon. Smaller skewers are now used, and remain (by removing them occasionally into fresh places) until about four o'clock: they are then withdrawn, but the cheese remains half an hour longer undisturbed, to allow the whey to drain from it. It is then, or some time in the evening, turned, a clean cloth is put over it, and the pressing continued, If the lever press be used, the weight may be a little increased.

On the *second day* the cheese is generally turned twice or three times; it is also skewered, and clean cloths are used each time of turning. I would observe here, that if any of the cloths are used again before they have been washed and dried in the open air, great care should be taken that they be well *scalded*. The presses used for at least the two first days, and, if possible, during the whole process, should be situate in the dairy, kitchen, or some other moderately *warm place*, otherwise the whey will be longer in discharging, and more liable on that account, from the acidity which it soon acquires, to injure the flavor of the cheese. Another advantage of the lever press is, that in cold weather it may be easily moved to a sufficently warm place, which cannot be the case with the common presses. These common presses are chiefly made of one square block of stone fixed in a wooden frame, but are also made of wooden boxes filled with *slag* or other heavy material. They are generally fixed by the walls of the dairy, for the purpose of being stayed to them, and being there most out of the way; when there is not room in the dairy or kitchen, they are placed in the salting room or pantry, which latter places are often much too cold for the purpose, as the whey seldom gets thoroughly extracted when the presses are in cold situations.

On the *third day*, the cheese is again turned once or twice, but ought not to require any skewering. The heaviest press is now had recourse to, and for a cheese of 60 lbs. or 70 lbs. weight about 30 *cwt.* will be pressure sufficient; but some dairy-maids apply as much as two tons, their heaviest press being that weight. A cheese-press of this weight, made of a block of red freestone, would be 3 ft. 2 inches long, 2 ft. 8 inches wide, and 3 ft. 2 inches high.

On the *fourth day*, it is usual in most dairies to discontinue the pressing, but in others it is continued for a day or two longer.

The cheese is then removed to what is called—

The Salting and Drying-Room.—Sometimes these are distinct apartments, but more generally one room suffices for both purposes. The salt can now, of course, be only applied *externally*; and the good, *if any*, effected is to harden the coat of the cheese. The cheese I have before alluded to, as having been made with three-quarters of a pound of salt, and which *was much above an average in quality*, was removed, as an experiment, *direct from the press to the cheese-room*. I am inclined to think this is the better system, or at least that a great deal of the present labor of the salting-house might be dispensed with.

It is, however, only right to state that in most of the dairies of this county the practice of *external salting* still obtains. I will therefore describe the process usually adopted.

The cheese is taken out of the vat, and a strong bandage called a "fillet," about 2 inches broad, and long enough to go three times round the cheese, is used. As this bandage is put on, salt is applied, underneath it, to the coat of the cheese. The bandage is fastened with strong

pins, the cheese placed on stone or wooden shelves or benches, and salt spread on the top to within an inch or two of the edges. The cheese is turned daily, and fresh salt and a clean bandage applied. In some few dairies it is the practice, before the salting above described, to half immerse the cheese for two or three days in strong brine, kept in a shallow tub for that purpose. The salting process above described is continued for various periods: by some for five or six days, by others as long as three weeks. I will give the rule followed by the farmer who furnished me with the particulars of his salting of the curd, (p. 143.) It is as follows:

From the beginning of the season (about March) to the time of the cows being turned out to grass, (12th May,) the cheese remains in salt four days; from thence to the end of July, ten days; in August, eight days; September, six days; and the rest of the season, four days.

It is obvious, from the practice in this dairy, that it is considered necessary for the cheese to remain in salt longer in the middle of summer than at other seasons.

After this salting, the cheese is well wiped or washed, has a clean bandage put round it, and continues in the same room, or an adjoining one, on wooden shelves, for the purpose of being *dried*. It is turned once a day, and remains until it is considered sufficiently dry for being removed to the *cheese-room*. The length of time for keeping cheese in the "drying-house" varies from seven to twenty days; and is regulated by the temperature of the weather, or the *cheese-room* to which it has to be next removed. In hot weather, and especially if the cheese-room is exposed to the heat of the noon-day sun, the change from a *too cold drying-house* (as many often are, except, perhaps, in the middle of summer) to a too hot cheese-room, is calculated to cause *cracks* in the cheese; which said cracks have from time to time to be filled up by the application of bacon-fat, or whey-butter, otherwise mites would soon be generated, and the appearance of the cheese detracted from. To prevent this cracking as much as possible, the salting and drying-houses have rarely, if ever, the windows opened, and drafts or currents of air are thereby prevented. This precaution is also adopted in the cheese-room; and, in addition, the light is excluded either by a shutter or *blind*, as I have before stated.

The cheese I have before alluded to as having been made without any *external salting*, as an experiment, and which *was taken direct from the cheese-press to the cheese-room*, was made in the beginning of June, and at the end of September was ready for the *market*. The quality of the cheese was better than that made in the ordinary way, and all the labor of the salting and drying-house was saved. My own impression is, as I have already hinted, that the drying-rooms are often *too cold*; and that if it is found to be desirable, as perhaps it may be in some dairies, to continue the use of such drying-rooms, the heat should be kept as near as possible at from 50° to 55°. In concluding my remarks on this room, I must not omit to observe that it is necessary the cheeses should remain *bandaged*, in order to prevent their bulging, and also that they should be turned over once a day. If one cheese be made daily, one will consequently—in the course of a certain time after the season of cheese-making commences—have to be removed every day to the *cheese-room*.—When taken to this room, the situation of which I have before described, it is usual to scrape and clean the coat of the cheese, and to place it, in the first instance, in the coolest part of the room—often for a few weeks upon shelves or benches, which are cooler than the floor; subsequently upon the coolest part of the floor, and ultimately upon the warmest part. It is usual to continue the bandage or "fillet" for several weeks after the cheese gets into this room, and indeed in some dairies until it is sold. It is also usual to turn the cheeses, and wipe them with a cloth daily, for at least three or four months, and every alternate day afterwards; and when there are any symptoms of cracking, bacon-fat, hogs'-lard, or some other fatty substance, is applied. The floor of the cheese-room is generally covered with dried rushes, or a coarse grass resembling rushes, called "sniddle," or wheat-straw. The floor should be *level*, otherwise the cheeses will not be kept easily in shape; and should be well washed with hot water and soft soap about twice a-year. The temperature of the cheese-room should, when attainable, range between 60° and 65°. When this is the case, the "first make" will generally be ready for the factor by September or October, and the "latter make" by December or January; but in consequence of many rooms being badly situated and imperfectly heated, the farmer very often does not get his cheese into the market until two or three months after these respective periods.—The object gained in having the cheese-room about the temperature I have named is threefold: the perfect fermentation and ripening of the cheese, the reduction of labor, and the quicker return of *profit*.

It is usual in this county to sell the cheese by what is sometimes termed the *long-hundred*, (120 lbs. to the cwt.) but the factors often require 121 lbs. The price varies with the quality of the article, the state of the market, and the size of the cheese; for large cheeses always sell for more per lb. than smaller ones. There is, perhaps, nothing more difficult to ascertain than the average price of cheese, inasmuch as both farmer and factor make the price a secret. The highest I heard of last season (1843) was 72s. per cwt. of 120 lbs., or a little more than 7d. per lb.; the lowest would probably be about 40s. or 45s.*

CONCLUSION.—I am aware that a great deal might still be said bearing on this subject. The various defects of cheese, the great difference in the flavor, the effects of different pasturage and food, and various other matters, might be discussed, but it is considered this essay is already too long and tedious. I shall, therefore, content myself by giving the following tabular statement, and the information promised in the Appendix. I cannot, however, close my remarks without expressing my admiration of the industry, cleanliness and frugality of the Cheshire dairymaids. Their labors are great indeed; their cleanliness not to be surpassed; and to their good management it is that the landlord may often consider himself indebted for the *whole of his rent*.

* There is a general wish on the part of the farmers to adopt the standard weight of 112 lbs., but the factors have hitherto in a great measure succeeded in purchasing according to the old custom of 120 lbs. The law for regulating weights and measures has little or no effect in this county, as the numerous customs at variance with that law, and still in operation, bear testimony.

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TABULAR STATEMENT

Of Observations taken at Four Farms in CHESHIRE: *viz., Nos.* 1 *and* 2 *in Bucklow Hundred; No.* 3 *in Nantwich Hundred; and No.* 4 *in Eddesbury Hundred.*

Note.—At Farm No. 1 there are Two Observations.

	Day of Observation.	Number of Cows.	Quantity of Milk at Two Milkings, (except No. 2.)	Heat of Milk when the Rennet was put in.	Quantity of Rennet.	Time occupied in Coagulation.	Heat of Curd and Whey after Coagulation.	Heat of Dairy or Room in which the Cheese was made.	Time occupied in gathering the Curd and completing the formation of the Cheese.	Quantity of Salt used internally.	Weight of Cheese a day or two after making.	Weight at some subsequent period.	Quantity of Cream taken from night's milk.	Quantity of Whey.	Quantity of Whey Cream.	Quantity of "Fleetings."	Size of Cheese.
			Galls.			h. m.			h. m.	lb. oz.	lbs.	lbs.	Qts.	Galls.	Qts.	Qts.	Inch.
No. 1.	Nov. 21.	42	43	83°	About 3 sq. in. of skin, 1 pint of water.	0 50	73° but raised with hot whey to 79°	..	5 0	1 1	55	47 Aug. 17 follow'g.	..	37½	5¾	4	15¾ Diam. 6¼ Deep. Aug. 17.
	Aug. 17 following.	48	Two Cheeses made in two Tubs. 59 53	88° 86°	3 sq. in. skin, ½ pint of water, to each cheese	1 0 1 0	.. 85°	68° at 7 o'clock.	..	2 4	58¼ 53	..	1½ ..	102 22	13¼ 3	.. 3	.. ..
No. 2.	Oct. 13.	10	24 Four Milkings.	78°	3 sq. in. skin, ¾ pint of water.	0 45	74°	..	4 0	0 4	..	..	1	47½	..	..	16 Diam. 7¼ Thick. Aug. 30.
No. 3.	Aug. 10.	26	56	..	..	1 0	..	78° at 11 o'clock.	5 15	1 0	60	..					
No. 4.	Aug. 19.	53	107	77°	12 or 16 sq. in. of skin, 1 pint of water.	1 45	72°	Morn. 64°. Noon 67°.	..	4 4 besides one handful in Milk.	Two Cheeses made; weight not ascertain'd	57 53 Sept. 16.	4	98	..	..	15 Diam. 8¼ Thick. 15 Diam. 8 Thick. Sept. 16.

These observations are not so complete as might be wished, not having been taken at the time in a *tabular form*, and with a view to publication.

Note.—Cheese loses about 15 per cent. in weight the first year.

APPENDIX.

THE SCALDING OF THE WHEY, AND THE MAKING OF WHEY-BUTTER.—This process is carried on simultaneously with the making of the cheese. The whey which comes from the curd previous to its being salted is called the *green whey*, and that which is extracted afterwards the *thrustings*, or white whey. The latter are more or less impregnated with salt. As soon as the principal part of the green whey is collected in the *set-pan*, a fire is lighted under it of Cannel coal, crop-wood, or other quick burning fuel. The remainder of the green whey is added after the fire is lighted. It is usual to skim off any small particles of curd which float on the whey, and give them to the poultry.—Whilst the whey is heating it is necessary that it should be frequently stirred, or it will be liable to burn to the bottom of the pan. When it has attained a heat of about 160° or 170°, if any whey is wanted for the family it is then taken out. When the whey has reached the heat of 180° it is in a fit state for *breaking*. This may be effected by any simple acid, but it is customary here to use sour buttermilk, and with it the *thrustings* of the previous day. The quantity of buttermilk necessary may be easily ascertained. I have only noted what was used in one instance, which was 1 pint of buttermilk and 2 quarts of thrustings, (which had been mixed the day previous to being used, and kept in a tolerably warm place to increase the acidity) to 22 gallons of whey. The *breaking* by this method, which is almost instantaneous, has the effect of causing all the creamy matter to rise to the surface, from which it is regularly skimmed off, and put into a cream-mug. The last skimmings are termed *fleetings*, and are generally reserved for the use of the servants. It is necessary, after the *breakings* are put in, to check or withdraw the fire, to prevent the whey from boiling. The refuse whey, after the cream is skimmed off, is ladled out of the pan for the use of the pigs; and it is generally conveyed by a spout fixed above the pan, which leads to a cistern or tub in which the pig-meat is kept.

The making of butter from *whey-cream* varies very little from the process of making butter from the cream of milk. The cream is kept for three or four days, or until it has become clotted (provincially termed *calved*.) Those who make the best whey-butter have a spigot and faucet to each of their cream-mugs to let off the whey, which in the course of a few hours settles at the bottom, and which, if allowed to remain, imparts a rank flavor to the cream, and consequently to the butter. The temperature of the cream, when put into the churn, is generally ascertained by the hand; but if a thermometer be used, the heat which I would recommend is 60°, having found that the best. If it be much *higher* than this, the butter may be expected not only to be soft, but inferior both in quantity and quality; and if much *lower*, the operation of churning will be prolonged, and indeed tedious. At this heat the time in churning will probably be about an hour and a-half. It will perhaps be necessary in cold weather to put hot water into the churn, and in warm weather to put in cold water, in order to attain this desirable object as to heat.

From 100 gallons of milk there will not be less than 90 of whey, which should yield from 10 to 12 gallons of cream, or 3½ to 4 pounds of butter. The quantity of whey-butter per cow is about half a pound per week, taking the season through; but with that small portion of cream of the evening's milk (to which I have alluded at p. 140) added, the farmer often churns as much as three-quarters of a pound of butter per cow per week, or from 20 to 25 lbs. per annum: 1 lb. of salt is sufficient for curing 37 lbs. of butter, if for present use.

CHEESE-COLORING.—This ingredient is or should be *annatto* (or *annotto*), the produce of the *Bixa orellana* of Linnæus. It is, I believe, chiefly imported from the West India Islands, and used for dyeing. The coloring chiefly used in cheese-making is *prepared* by manufacturers in this country for the purpose. It gives the cheese that amber or cream-like appearance which is unfortunately required in order to *please* or *deceive* the eye of the London consumer. For the Manchester and Liverpool markets, and for *home* consumption, the Cheshire farmer rarely uses it in his cheese-making, as it is well known it does not improve, but if an inferior article is bought, and especially if much be used, it may deteriorate the flavor very much. Those who wish to be enlightened on this subject would do well to read the "Essay on Cheese-Coloring," written by Mr. Whitley of Stretton, published by Ridgway, in which it is clearly proved that the greatest bulk of the cheese-coloring used in this country is only an *imitation of annatto*, but sold by that name, and consisting of such ingredients as tumeric powder, potash, and soft soap or train oil, well mixed to form a mass along with a *little* "real Spanish annatto." I cannot, for two reasons, here resist inserting a verbatim copy of a paper which was printed and published several years ago by a cheese-factor in Cheshire: *first*, because it is an acknowledgment, on his part, that much bad coloring did then exist; and, *secondly*, because it contains 'A Word of Advice to the Dairy-maid,' which shows what were considered some of the defects of the dairy system at that time, and what in his opinion the remedies. Many dairy-maids even *now* would do well to attend to this latter advice.

"LOOK YOU HERE, AND BUY ——'S COLORING.—To all that may be concerned in making colored dairies of cheese, —— begs to inform the users of annatto, for the purpose of coloring, that he has for the last ten years felt sorry to his heart for great numbers of dairy-owners, to see such bad colored dairies as he in general has done, and the very great loss the owners thereof have annually met with on this account.

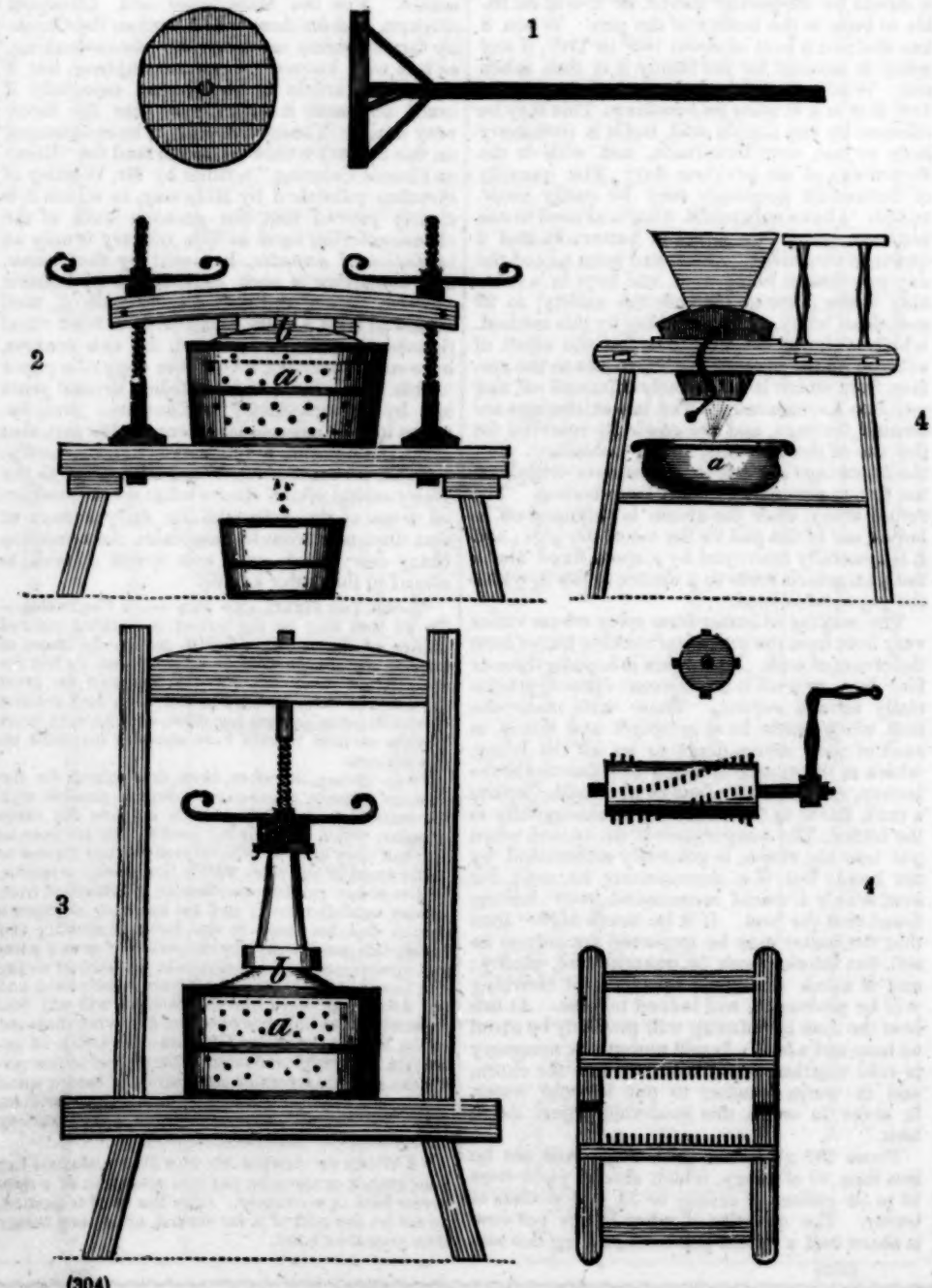
"—— having, therefore, been determined, for the farmers' interest, to use every influence possible with the manufacturers of this article to have the same genuine, which till lately has been to little purpose, as one-half they have in general sent out has proved to be far short of the color which the market requires, he has at last gained considerable information from sundry manufacturers; and he has now engaged a person that has been in the habit of making and seeing this *article made for the period of twenty years* and upwards, and as —— is now in the habit of seeing and hearing what other manufacturers have been and are doing, convinces him that farmers will still find themselves but little better off by following their old mode, he has determined to make the article of annatto in its genuine and original purity, and is now giving the public a favorable opportunity of having some of this very superior coloring, which, from its brilliant color, will recommend to the farmer a great variety of customers for their choicest dairies."

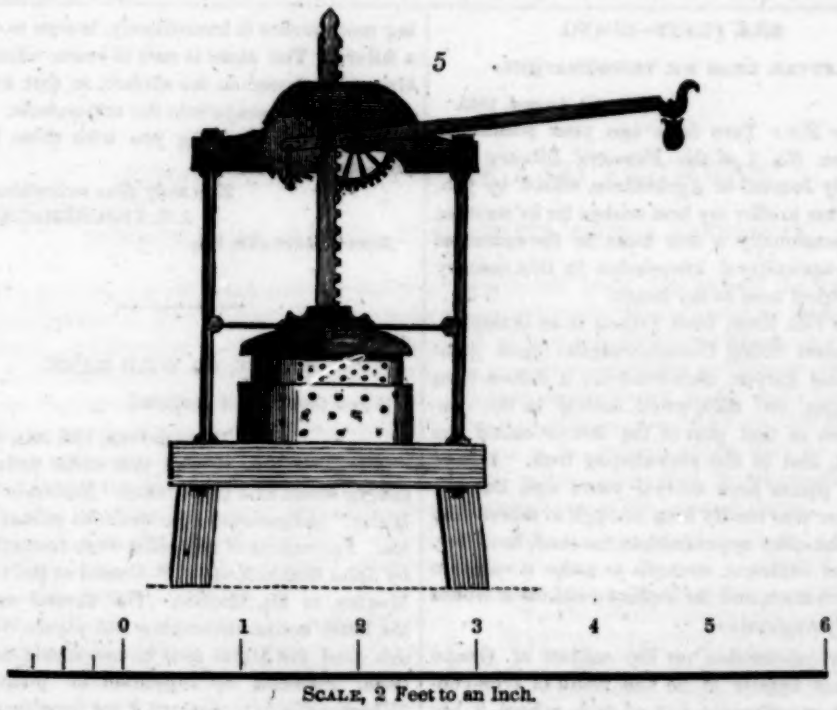
"A WORD OF ADVICE TO THE DAIRY-MAID.—Let your rennet or steep be put into your milk of a temperate heat or warmness. After the curd is formed, do not let any part of it be starved, or get any colder than your own hand.

"All dairy-maids that would have real fine-flavored cheese would do well to thrust it with their hands, that there are no cold draughts from doors upon their curd, but keep it gradually warm, but not to scald it neither with water, whey, nor burning vats. Have your first press not too heavy, and in as moderate a warm place as you can possibly place it; study a warm salting-room; use neither flags nor slates for your cheese to lie on, but good planks; your drying-room to be moderately warm, and also your cheese-room; cold damp rooms, flags, or slates, will spoil the handiwork of the best dairy-maids; you should never suffer your cheese to be starved, or get into a cold damp state, as it very materially hurts the flavor.

"Good calf-skins, or calves' bags, as are invariably made use of, are of serious consequence to the flavor and the coming of the cheese."

A Recipe for Curing the Maw-Skins.—Procure the skins fresh from the butcher the year previous to their being wanted; clean out the chyly matter, and every other apparent impurity; the inside is then turned outward on a table, and salted; the skins are then laid one upon another, with a layer of salt between each, in a deep earthenware vessel similar to a cream-mug; they are then covered over with salt, and have a lid of slate or flag placed on the top. They are taken out as wanted, about a month previous to being used, and the brine drained from them. They are then spread on a table, and fine salt is powdered on each side. In this state they are rolled with a paste-roller, distended with a splint of wood, and hung up to dry.





SCALE, 2 Feet to an Inch.

From the London Ag. Gazette of June 21, 1845.

ELECTRO-CULTURE.—A late number, containing a statement of your mode of supplying the electric fluid to plants, appearing to you as good an arrangement as that which I, after much and years of thought directed to the subject, adopted. and which has been since promulgated, will, I hope, be a sufficient excuse for giving some of the reasons why it is not as yet with you attended by beneficial effects. Both the north and the south end of the wire suspended and collecting the electric fluid ought to be in metallic communication with the buried wires, otherwise the circulation of the electricity is intercepted, or nearly so, for I find that the corners of my plots do not affect the magnetised needle similarly; thus, although the south end of the suspended wire attracts the south pole of the needle, and the north end of the wire the north pole of the compass-needle even at some distance, the south-eastern and north-eastern corners of the buried wire both attract the north end of the needle, while the south-western and north-western attract the south pole of the needle; and as this result cannot be obtained with the wires buried and disposed as in your experiment, so also the result cannot be similar to that which it is in my arrangement. Besides, the electric tension of the air has, until the last few days, been so low, that any very perceptible beneficial influence for the last two months could not have reasonably been expected, any more than a windmill would be of use when there exists little or no wind. Experiment on eight acres in one plot has already proved that large areas may be electro-cultured, although as at first advised by me the parallelograms should be longer north and south than they are wide from east to west in the proportion of one to two or three, and every increased width of about 30 to 40 yards, beyond the first 30, should have at least one additional suspended collecting wire. "Beta" observes, that the effect of the electricity extends without the plot surrounded by the buried wire. My observations lead me to believe that it does so in a very limited degree to the eastward. the line of corn improved on that side being concave, or receding from the east in the mid-length of that side, which it was in about the same degree convex, or tending beyond the wire to the west, on that side. The explanation given above why the diverging wires had not the same influence when supplied with electricity as the circumventing wires, also indicates the reason why the effect is so nearly confined to the plot, or area, included by the latter. I would also advise your floricultural readers to have the whole of the buried wires, poles, &c., arranged at once, if not previously done, but not to erect the suspended wire until the flower-buds are beginning to be formed. otherwise the plants will thrive to an unusual extent, as I have seen this year they did in the hands of a friend, and the flowers will in consequence be injured in a degree, while if the additional power is added just as the flower-buds are formed, nearly the whole of the increased supply of fluid will be employed in the development of the flowers, which are, in consequence, larger, more perfect, and the colors more brilliant.

[R. Dewey Forster, Findrassie, near Elgin.

SILK PLANT—GUANO.

LETTER FROM MR. TESCHEMACHER.

BOSTON, 4th August, 1845.

Dear Sir: Two days ago your publishers sent me No. 1 of the Farmers' Library and Monthly Journal of Agriculture, edited by you. Allow me to offer my best wishes for its success, and occasionally a few hints, as the spread of sound agricultural knowledge in this country is an object near to my heart.

Your Silk Plant from Tripoli is an asclepiadeous plant called Gomphocarpus, (from gomphos and karpos, club-fruited); it differs from Asclepias, our milk-weed, merely in the construction of that part of the flower called the corona, and in the club-shaped fruit. I have raised plants here several years ago, but the Summer was hardly long enough to mature the fruit, the silky appendage to the seed, however, is not of sufficient strength to make it valuable for cultivation, and for stuffing cushions it would be very expensive.

Your information on the subject of Guano does not appear to be the result of well-conducted experiments, but of such, where it has been applied, as chance directed. In Mr. Breck's paper (New-England Farmer) last Autumn, I suggested that the Agricultural Society of Massachusetts should offer a handsome premium for the best-conducted Agricultural Experiments on this subject; we should then have had valuable and authentic information. I thought it within the range of their duties; they, I suppose, thought otherwise, and nothing was done. Having myself only a little garden spot, of course it was out of my power to make agricultural experiments, but what could be done in a small garden I have done.

I confess I am surprised to hear of so many failures—*all* which I have been able to investigate, arise from error in application. In no soil but a stiff clay can it fail to produce its effects; in no soil but one amply provided already with phosphate of lime, can its effects fail to be permanent. In arid soils it is, properly applied, of great value, as it infuses that strength and solidity into the juices which enable the plant to withstand the drouth. To this object, one of my experiments has been devoted with perfect success. On a southern bank, my peas were green and fresh, while those of my neighbors, with manure, were brown and burnt up. This, and every other efficient action of Guano, is produced by reflecting on the growth and position of the roots of plants, and placing the Guano in such a situation that they may reach it when they are of a pretty good strength, and the moisture of the soil has sufficiently decomposed the manure; but sowing the seed in contact with Guano, or placing where the young sprouting root touches it immediately, is sure to cause a failure. The same is sure to ensue when the Guano is spread on the surface, so that ammoniacal virtues escape into the atmosphere.

Excuse my troubling you with these hasty lines, and believe me,

Most truly your well-wisher,
J. E. TESCHEMACHER.

JOHN S. SKINNER, Esq.

NATIVE, OR WILD MAIZE.

[From the National Institute.]

WASHINGTON, 15th July, 1845.

My Dear Sir: I send you some pods, containing seeds, of a plant called "Native, or Wild Maize," indigenous to the southern part of Mexico. Specimens of this plant were recently sent by John Black, Esq. U. S. Consul at the City of Mexico, to Mr. Markoe. The Consul says, in his letter accomompanying the plants, "From this seed the Maize now in use, is said to have been produced by repetition of plantings." Whether this is true or not, I am not able to say, but am inclined to doubt it.* In this opinion I am sustained by Mr. Rich, Botanist of the Exploring Expedition. It would, however, be interesting to plant the seed, give it a fair trial, and ascertain what changes, if any, it would undergo by cultivation.

Its mode of growth is totally different from that of our common Indian Corn, and it seems to me almost impossible that it should ever even assimilate to it.

With respect and esteem, your friend and obt. sevt.
JNO. Ks TOWNSEND.

J. S. SKINNER, Esq.

[* The improvement appears to us not to be greater than has been accomplished by cultivation in some other cases. The plant may be seen at the office of the Farmers' Library.—*Ed.*]

☞ The beautiful illustration of the COTTON PLANT, by Mr. S. B. THORPE, of Louisiana, "taken from life," which adorns this number of the Farmers' Library, will, when the volume is bound, more properly belong to the October number, in which we propose to commence, if not to conclude a sketch of the history and uses of Cotton, from the classical pen of W. B. SEABROOK, Esq., President of the South-Carolina Agricultural Society. In that number, too, we expect to give the first of a series of papers, on the growth and manufacture of the SUGAR CANE, from a gentleman whose pen casts new light on whatever it touches.

THOUGHTS ON TREES AND FLOWERS,

SUGGESTED, OR REVIVED, BY A LETTER FROM A CLERGYMAN.

We give place to the letter from our obliging friend, the Rev. J. O. Choules, with particular pleasure, and the more so, as it seems to warrant the hope that we may regard it, to speak in language that every farmer will understand, as an entering wedge—or, shall we say, as a *nest-egg!* the use and value whereof needs no explanation for one who felicitates himself, as will be seen, that he "has been very successful this year, in raising a large stock of poultry," and almost promises to say his say about *chickens*, for the Farmers' Library.

But we cannot suppress the wish that our friend had dwelt more and longer, as we are sure he might have done with force and elegance, on the science and the virtue of the *love of Trees and Flowers, and of Landscape Gardening*, as eminently worthy of more general and higher cultivation in our country, and yet most greviously and shamefully neglected. Fully impressed, as we are, with the fine effect which would ensue the spread of such a taste, as well on the moral sentiments as on the physical aspect of the country, we should rejoice to have it inculcated, and in every form illustrated through the pages of the Farmers' Library, by one who could so well persuade others to act upon the sentiments, which on that subject, he evidently entertains himself with so much enthusiasm that he would be ever saying, with Sir Walter Scott, to the gardener—"Take care that ye be aye planting a tree!"

In this interesting matter of encouraging and enlightening the public taste for Landscape Gardening, Downing, as we have elsewhere said, is doing for us, what was done with less existing necessity for England, by Repton and Price, and more recently by Loudon; and now, as we are advised by the letter of Mr. Choules, we are to have another book on Trees, to cover the ground, if any which may not have been occupied by the amiable and eminent artist who distinguishes Newburgh by his residence, his trees, his fruits and his flowers; and above all, by making that the centrifugal point for the diffusion of so much elegant and useful knowledge.

Undoubtedly it is in the power of the *Clergy*, as has been well and opportunely suggested by Mr. C. and especially of those resident in the country, to do much in exemplification of the science and the beauties of Arboriculture; and how better could they enforce the spirit of all true religion? For it would be as impossible for oil and vinegar to commingle, spontaneously, as that unmitigated selfishness and misanthrophy should dwell in the same bosom with the love of trees and of flowers. Of this Byron seems to be aware, where thus he seeks, by some redeeming touches, to relieve the desperate character of the greatest Pirate

> "That ever scuttled ship or cut a throat."
> —Old Lambro.
>
> "Still o'er his mind the influence of the clime
> Shed its Ionian elegance, which show'd
> Its power unconsciously full many a time,—
> A taste seen in the choice of his abode,
> A love of Music and of scenes sublime,
> A pleasure in the gentle stream that flow'd
> Past him in crystal, and *a joy in flowers*,
> Bedew'd his spirit in his calmer hours."

Nor is a partiality for such studies by any means incompatible with the highest degree of literary and scientific attainments. On the contrary, as truly stated by Mr. Downing, in his Historical notices of Landscape Gardening, the glory and merit of the revolution, from the stiff and formal to the easy and natural style of gardening, belong to two among the brightest luminaries of English Literature, Addison and Pope.

To Pope's powerful agency in achieving the great modern reform upon the old angular system practised before his day, in laying off gardens, emphatic testimony is borne too by Horace Walpole in his letters to Sir Horace Mann.

It has, indeed, been affirmed, and the observation is doubtless as just as it is natural, that there is an intimate connexion between Landscape Gardening, Landscape Painting, and Landscape Poetry: it being the province of the first to create, the second to paint, and the third to describe the scene. It is urged that the subjects on which they work, are the same, with this difference, that the range of the Landscape Poet is wider and more varied than those of the others; and is addressed to the eye and the ear, while the others are confined to the impressions made on the mind through the eye. Whence it appears that the Landscape Painter is much indebted to the Landscape Gardener, for the vast variety of pleasing and striking objects that are made to harmonize with each other in scenery which the gardener has brought into view, but which, if

left to nature, could not have been viewed to advantage, nor presented as pleasing objects in Landscapes. For a like reason the Landscape Painter is much indebted to the Landscape Gardener, for concealing objects which are disagreeable to the eye, and for filling up broken defects in a scene which he could not have represented on canvass as a complete whole. The Gardener effects this by planting characteristic trees where the landscape is broken; and also to conceal defects and repulsive objects. These trees become conspicuous objects, and when tastefully disposed, produce a pleasing harmony on which the mind dwells with admiration and delight. The Poet on the other hand, is not less indebted than the Painter to the skill and taste of the Gardener for the harmony and variety of soothing and delightful objects produced by him, which are naturally creative of new ideas, and which enrich his compositions by affording materials for his discription of sublime, picturesque and beautiful scenery.

We ought not, we cannot omit the occasion, to urge upon all who have influence in shaping public opinion, and through it the legislation of the Country. the importance of taking measures for having the arts of design taught in all our schools. How many millions does France levy on the world, entirely owing it to her proficiency in the Fine Arts? How else has she embellished her capital and sent her armies into foreign countries, at an expense that would have otherwise overwhelmed her in bankruptcy, but that her inimitable proficiency in the arts of tasteful invention enables her to sell to other nations the millions on millions of fabrics and manufactures which, with equal cultivation of the arts employed in their preparation, they ought to make at home—who would believe, that with a greater variety and beauty of timber and material for textile fabrics and ornamental household furniture, the United States imported many hundred thousand dollars worth of fine goods and furniture in the last year from France! Why is it that in the fashion of a sofa, a picture-frame, or a sideboard, or a smelling bottle, there should be as much difference between French and English or American design, as between the square and compass style in Landscape Gardening, of "*capability* BROWN," and the easy natural good sense style into which Repton reformed that beautiful art? Clearly because in France the art of design takes the place of Latin and Greek in the general course of education. See how the value of it is illustrated in working up a dollar's cost of flax, into a fabric for which the Princess or the Millionaire pays $1000! Thus it is that she puts the whole world under contribution to her excellence, in those arts which it should be the careful policy of every wise nation to foster—can it then be too often urged that here is to be the great beginning point of reform in our educational systems. We should bend the twig as we would incline the tree. Even the scene-shifter, at first deaf to the charms of music, will in time have his ear attuned to harmony. Already has Yankee ingenuity learned to excel the world in the coarser fabrics until the native troops of Calcutta are seen to strut in Lowell manufacture. We need not the capacity nor docility—what we want is the *taste*, to be created in our public schools, by our public writers, by exhibitions of American Institutes, and above all by wise and liberal legislation.

To return to the art of Landscape Gardening and Drawing—the principles should be taught in every public school in New-York to begin with. Practical Horticulture itself, when properly understood is to be regarded as an intellectual, and therefore, and in that proportion, an honorable pursuit; for even that requires a knowledge of the various kinds of soil, and the action of the different manures, combined with a knowledge of the outlines of botany at least, and of vegetable physiology. But to practice the finer art of Landscape Gardening, and to lay down rules for the improvement of Country Seats and Public Grounds, demands even more than ordinary acquirements, yet not more than might well be taught in its rudiments at least in all our Common Schools, and in its higher degrees in a National Institute, such as the Smithsonian Legacy might and ought to establish and provide for at Washington.

The sooner education in any art or trade is commenced, the greater will be the proficiency—who would think of taking up a lad of twenty to make him a rope-dancer any sooner than a horse in his teens to make him a racer? Would you have your son turn out a Paganini, put the violin in his hands in his earliest youth—so when more difficult arts are to be taught, as painting, for instance, or sculpture, give him the pencil and the chisel as soon as he can use them, and place before him the most beautiful models—inspire his genius and animate his ambition by grand and sublime images from Virgil, Homer, and, above all, MILTON—after all the first to give true and grand conceptions of Landscape Gardening, as he was the first of Poets—lastly, opportunity should be afforded to study, when it can be done, the pictures of the great masters, such as Raphael, Guido, Correggio and others, that he may in these study the magic of design, composition, coloring, &c., and oh! that in our Country, we may see the day, that enlightened public sentiment and reformed legislation shall decree to excellence in the fine arts and in industrial pursuits, the honors and rewards which military despotisms, and some Republics, in servile imitation of them, have reserved so

exclusively for military excellence, and that sometimes of more than doubtful stamp.

To enter on the profession of a Landscape Gardener, a young man should possess, not as we are too apt to suppose, a mere knowledge of reading and writing; he should have a competent knowledge of arithmetic, geometry, and trigonometry. He must learn, as we have had occasion to say before, Landscape Painting, in order to comprehend the true principles of this fine art, and to enable him to draw embellished designs, and to represent the legitimate characters of landscape scenery. He ought to possess, too, some knowledge of architecture, to qualify him to sketch elevations.

But it was not within our design to write a dissertation on this subject. Mr. Downing has supplied that desideratum with great taste and ability. All we can do is to admire what he has done so well, and to raise our feeble voice in favor of more general and adequate provision for instruction, not only in this, but in all the arts of design—arts which may display themselves as well in every article of clothing and furniture; in the trappings alike of the soldier and his steed; in a sand-box or an ink-stand; in the binding of a book, as in the shape of a goblet; in the fashion of a garden-seat, as in the form of the celebrated "mystic urn," about ten inches high and six in its greatest diameter, for which the DUKE OF PORTLAND gave *one thousand guineas!*—known throughout the world as the PORTLAND VASE.

On a late visit to Saratoga, there was nothing which so agreeably impressed us as the evident partiality for trees and flowers, which marks the progress of improvement at that salubrious resort within the last fifteen years—clearly indicating the existence of good taste on the part of the inhabitants and the keepers of the public establishments, while it manifests the general growth of refinement, since these improvements about the hotels are addressed, we may suppose, to the taste of their visiters, and are expected to form agreeable and popular attractions.

It is not easy to measure the influence which a few individuals in any town or neighborhood may exercise in disseminating a partiality for such adornments of the mansion and surrounding grounds; and whose example so likely to prove efficient as that of the Pastor of a country parish, whose profession naturally leads him to look and to point to the visible works of the Creator, as the most captivating and conclusive proofs of His wisdom and beneficence? And, of all the productions of the organic world, what so grand as trees! what so sweet as flowers! so beautiful as birds!—and, may we not add, what country has Providence so bountifully supplied with all these as the Americas! The variety and magnificence of our autumnal scenery have extorted admiration even when beheld by the jaundiced eyes of tourists, as ready to find fault where none exists, as to expose the many which candor must not allow us to repudiate.

In religious history, too often stained with bloody strifes, there is nothing more redeeming and consolatory than the addiction to Horticulture, Floriculture, and rural embellishment, alluded to in all accounts of ecclesiastical life and habits in the early ages:

> "And to his own judicious pains
> The *Vicar's dwelling* and the whole domain
> Owes that presiding aspect which might well
> Attract your notice."

Of what these elegant pursuits owe to the Clergy, there is, to go no further, abundant testimony in the grounds about St. Mary's Seminary at Baltimore, and the Catholic College in Georgetown, D. C., and all know that in the bloody footprints of the conquerors of Peru and Mexico, the Roman Catholic priests followed, as planters of the choicest fruits and vegetables of the Old World. Thus did a Christian Ministry endeavor to efface the remembrance of cruelty and rapine, perpetrated by a Christian Soldiery on the unoffending Natives of America—who, according to PRESCOTT, easily the first of American Historians, had already manifested a passionate love of flowers, and had carried their culture to a high state of excellence. The love of home and the force of patriotic associations in their minds were touchingly evinced in the feelings which Humboldt tells us prompted the Catholic Priests to call around their friends for festive enjoyment over the first bloom and earliest ripening of flowers and fruits which had been brought with them from old Spain.

Vegetable Physiology, including the character and uses of trees, has been the study, as already intimated, of men of the highest eminence among Naturalists, and Poets, and Statesmen; and even learned Jurists have brought this sort of knowledge into professional service—for questions of law, as is well known, have been settled by counting the concentric circles of trees, to determine doubtful boundaries. Thus may trees be said, almost without a figure, to have spoken to the patient truth-searching Chancellor. By their means,

> "———— facts and events
> Timing more punctual, unrecorded facts
> And misstated setting right,"

he has the better succeeded in unraveling and baffling complicated schemes of fraud, and so restored the scales of Justice to their even balance.

The present CHANCELLOR BLAND, of Maryland—a great lover and connoisseur of trees, and neither an indifferent or unlearned student of Vegetable Physiology generally—might, we know, contribute something to the stock of

knowledge on these subjects, if he could take time from his fields and his books.

Cowper, we remember, well indicates, in his affectionate apostrophe to the old "Yardly Oak," which had fallen into decay, not only his knowledge of the physiology of trees, but, in the following lines, shows his estimate of the value of that best of all timber for ship-building:

"Time was, when, settling on thy leaf, a fly
Could shake thee to the root—and time has been
When tempests could not. At thy firmest age
Thou hadst within thy bole solid contents, [deck
That might have ribbed the sides and planked the
Of some flagged admiral; and tortuous arms,
The shipwright's darling treasure, didst present
To the four-quartered winds, robust and bold,
Warped into tough knee-timber, many a load!
But the ax spared thee."

Shall we not gratify many readers, and carry them back to well-remembered youthful days and feelings, by introducing here the last verse of Campbell's "Beech-Tree's Petition"—"Oh leave this barren spot to me"?

"Thrice twenty summers I have seen
The sky grow bright, the forest green;
And many a wintry wind have stood
In bloomless, fruitless solitude,
Since Childhood in my pleasant bower
First spent its sweet and sportive hour—
Since youthful lovers in my shade
Their vows of truth and rapture made,
And on my trunk's surviving frame
Carved many a long-forgotten name.
Oh! by the sighs of gentle sound
First breathed upon this sacred ground—
By all that Love has whispered here,
Or Beauty heard with ravished ear—
As Love's own altar, honor me:
Spare, woodman, spare the beechen tree!"

Decandolle, one of the most celebrated botanists of modern times, has paid great attention to the mode alluded to above, for ascertaining the age of trees by counting the concentric circles.

Humboldt considers a certain Boabab tree of Africa the oldest organic monument of our planet; and Adanson, a distinguished botanist, has, by ingenious calculations, ascertained its age to be 5150. Examples of the species have been seen, it is said, which, with a trunk ninety feet in circumference, were only twelve feet in hight. A still larger was seen by Mr. Golberry in the valley of the two Gagnacs in Africa. It was thirty-four feet in diameter. The flower, says the account before us, is of the same proportions as the tree. A Tree of this species has lately attracted the notice of Mr. WISE, our Minister at Rio, and is the subject of a letter to Mr. Markoe, Secretary of the National Institute. There is a Cypress in Mexico which is said to be one hundred and seventeen feet in circumference, and which the younger Decandolle considers to be even older than the Boabab of Adanson. The Yew is supposed to be the oldest tree in England, where some are growing which are confidently believed to be much older than the introduction of Christianity. The Yew of Brabourn Churchyard, in Kent, has attained the age of 3000 years; but that, says Chambers, at Hedsor, in Bucks, surpasses all others in magnitude and antiquity.—It is in full health, and measures above twenty-seven feet; consequently, according to Decandolle's method of computation, which we have not taken room to describe, this Yew has reached the enormous age of 3240. In all likelihood, this is the most ancient specimen, says our author, of European vegetation.

But without having time or space for half the train of thought lighted up by the letter of our friend, who could so much better do justice to the subject, we must recur once more to the taste for floriculture and tree-culture, displayed in and around Saratoga, to pay a slight tribute to those who have promoted it.

Very little inquiry led us to regard, as among those who had been the most prominent in this praiseworthy employment, Mr. ALEXANDER WALSH, of Lansingburgh, Col. S. YOUNG, a most enlightened and powerful promoter of the cause of Education, Doctor CLARKE, Mr. DAVIDSON, Mr. MARVIN, of the U. States Hotel, and the Messrs. PUTNAM of the Union House, and others in that beautiful village. The grounds of the United States Hotel there are distinguished by the extent and cleanliness of the *lawns*, shaded by the Linden, the Sugar Maple, the Mountain Ash, and other beautiful trees, while the taste of the proprietor of the Union, has besides ornamented his with an assemblage of sweet flowers, enough in variety and character to satisfy even the fanciful demands of Mrs. Hemans, for all the purposes designated in the beautiful lines—"BRING FLOWERS—FRESH FLOWERS." Thus she says:

"Bring flowers to the *captive's* lonely cell—
They have tales of the joyous woods to tell.
* * * * *

"Bring flowers fresh for *the bride to wear*;
They were born to blush in her shining hair.
* * * * *

"Bring flowers—pale flowers—on *the bier to shed*;
A crown for the brow of the early dead.
* * * * *

Closing the utterance of her enthusiastic devotion at the shrine of Flora, by this beautiful invocation:

"Bring flowers to the shrine, where we *kneel in prayer*,
They are Natures offering, their place is *there*;
They speak of hope, to the fainting heart,
With a voice of promise; they come and part;
They sleep in dust, through the wintry hours;
They break forth in glory—bring flowers—bright flowers."

There is a Larch, growing in the neighborhood of Saratoga Lake, so nearly resembling the European as to make it difficult to distinguish between them. There seems to be a sort of capricious sporting irregularity in its fashion of sending out its minor branches single here or there, without rule or uniformity, which is at once un-

common, and therefore, perhaps, more pleasing. A cursory passenger might overlook the native Larch, there called Tamarac, among its neighbors of pines and coniferous trees; but a slight observation serves to disclose its peculiarities, and to recommend it as a tree worthy of transplantation to any more southern residence to which it can be reconciled. That its *habitat* has been heretofore limited, and that it deserves all that we could here say to make it more widely known, suffice it for us, that Mr. WALSH, whose amiable and cultivated enthusiasm in the cultivation of flowers and trees, is so well known, has lately drawn it from its native haunts to give additional charms to his highly ornamented grounds at Lansingburgh, not many miles north of Albany.

We wish it were in our power, in the hope of stimulating others to go and do likewise, to give a catalogue of the very many flowers and trees that serve to embellish the gardens and grounds of Col. S. YOUNG, Mr. A. WALSH, and the gentlemen in Ballston and Saratoga, who have done so much to beautify their respective villages, and to encourage a taste so honorable and praiseworthy; one for which, however, one might suppose sufficient inducement might be found, were it only in providing the attraction and shelter which trees and shrubbery offer to innocent birds, to come around with confidence, and in our very view and hearing sport their loves, and build their nests, and rear their young, and sing their songs. Shall we take room to let the reader admire, once again, how well all this is painted by the Poet of Nature in his lines on the

PAIRING OF BIRDS.

When first the soul of love is sent abroad,
Warm through the vital air, and on the heart
Harmonious seizes, the gay troops begin,
In gallant thought, to plume the painted wing;
And try again the long-forgotten strain,
At first faint-warbled. But no sooner grows
The soft infusion prevalent and wide,
Than, all alive, at once their joy o'erflows
In music unconfin'd. Up springs the lark,
Shrill-voic'd, and loud, the messenger of morn;
Ere yet the shadows fly, he mounted sings
Amid the dawning clouds, and from their haunts
Calls up the tuneful nations. Every copse
Deep-tangled, tree irregular, and bush
Bending with dewy moisture, o'er the heads
Of the coy quiristers that lodge within,
Are prodigal of harmony. The thrush
And wood-lark, o'er the kind-contending throng
Superior heard, run through the sweetest length
Of notes; when listening Philomela deigns
To let them joy, and purposes, in thought
Elate, to make her night excel their day.
The black-bird whistles from the thorny brake;
The mellow bull-finch answers from the grove:
Nor are the linnets, o'er the flowering furze
Pour'd out profusely, silent. Join'd to these,
Innumerous songsters, in the freshening shade
Of new-sprung leaves their modulations mix
Mellifluous. The jay, the rook, the daw,
And each harsh pipe, discordant heard alone,
Aid the full concert: while the stock-dove breathes
A melancholy murmur through the whole.

As a patron of Arboriculture, we might say of Agriculture generally, Mr. LENNOX must excuse the public mention of his name. In a spirit worthy of emulation, he has planted, as we are informed, by a much respected friend of his, not less than *fourteen thousand forest and fruit trees* on his estate, on the left bank of the Hudson. Among these, in ages to come, may be found witnesses of his liberality, more enduring and unequivocal than monuments of marble or brass. The vine, too, that symbol in all ages of plenty and happiness, is there an object of especial attention, being made to beautify his grounds by the curious and fanciful props devised for its support—thus it is that taste is seen to combine grace and utility; and how much better is such employment of time and means, by those who are the favored of fortune, than vexing their lives with continual anxiety to accumulate—*more—more—a little more!* which, after all, must be left behind, to be squandered, finally, by we know not whom; on objects, we know not what? But of all the tenants of our woods, were we to to select one to represent the American forests with most grace and majesty, in a grand Congress of Trees, we should give the commission to an *Elm*, on "ELM-LAND," the estate of JOEL ROOT, Esq. fourteen miles from Saratoga, which measures at its base, 44 feet in circumference, at 3 feet from the ground 22 feet, and at 6 feet from the ground 17 feet, maintaining nearly that size to the height of sixty feet, when its branches commence, and as they rise, spread gracefully, until they overhang an area of 100 feet.

The celebrated Pittsfield Elm, admired and remembered by all who have seen it, and which yet survives a severe stroke of lightning, measures about fourteen feet at three feet from the ground. But were we called on to send to such a Congress of Arborical Sovereigns, a tree that by some magic could be invested with power to give voice to the profound reflections on the history of the various nations and governments of ancient and modern times, which, under its shade, may have had their birth in the solitary musings of its owner; *then* give us the great Elm that overshadows the MARSHFIELD mansion—thus so accurately described by our friend BRECK, of the New-England Farmer.

"The most striking object which meets the eye at first sight, is a majestic Elm tree, near the East corner of the house, which forms a complete bower. It stands on an oval grass plot, which makes a fine carpet for the bower. At a distance of eight or ten feet from the ground, the branches in every direction horizontally, gently curving over till they rest upon the greensward, excepting on the side next the house, where it has been necessary to cut out some of the lower limbs, that carriages may pass to the easter door. The branches on this side nearly touch the house, and form a complete canopy to this entrance. The longest diameter of this tree-bower is 94 feet—perhaps 70 the other way.

Seats are arranged around the tree, near the trunk, where is a most delightful retreat, especially in such a day as was that when we enjoyed its shade, the thermometer indicating the heat as near 90°. The tree is said to have been planted 80 years ago."

THE CLERGY,

THEIR OPPORTUNITIES AND POWER TO IMPROVE THE PUBLIC TASTE FOR AGRICULTURE AND HORTICULTURE.....LETTER FROM REV. J. O. CHOULES.

JAMAICA PLAIN, August, 1845.

My Dear Sir—I have for several days past been trying to get time to tell you how very much I have been gratified with your capital No. 1 of the Farmers' Library, &c. The conception of the work is precisely (I think) what it should be, and the execution of the Magazine very satisfactory. I entertain no doubt respecting its success. I wish it could find its way into the hands of our Clergy; they are of all men possessed of the best opportunities to improve the taste and science of the farmers of our land. Had I the time, I would gladly write an article for your pages, pointing out the claims of Agriculture and Horticulture on the Ministry. I know some of my brethren who feel this subject in all its magnitude; they aim to diffuse correct opinions, cultivate good taste, make *men happier, and places prettier*, because they have lived in the region; and verily they have their reward. For my own part, I would rather get the population of a village all out to plant trees, and beautify the walks and avenues of the hamlet, than convene them to argue upon abstract notions of no possible practical utility. We may learn a great deal that is good from the example of men who went before us. If we dislike the faith, at all events we may admire the taste, of the Churchmen of other days, whose abbeys and cloisters all testify to a sound taste, and whose noble avenues and orchards proclaim good husbandry.

I wish I could set hundreds of men planting trees who seem to delight in worse labors. I do love trees, and I love the men who planted the Elms of New-Haven, Newark, and those of the sweet village I live in. Why does not every man plant out a tree—many trees? In Providence there are some noble Elms which I saw planted only twenty years ago! A man *may see* the result of his labors, and his children would be proud to point out the trees, "the old ancestral trees," of his forefather's planting.—Men may rail at the world as much as they please, but *it is a beautiful one*, and if we are only cheerful and active in it, it will become yet more beautiful. Nearly all the beauty of a residence, a village, a country town, arises from its trees; and not only should every man carefully adorn his own habitat, but men should club together to beautify their vicinage. The strong attachment felt by men in England to homesteads arises in no small degree from the pains which have been taken to adorn and enrich them by a previous generation.

Perhaps my mind has taken this turn from having just been engaged in a cursory perusal of the proof-sheets of Mr. D. J. Browne's charming work on the Trees of America, now in the press, and to be published this winter by one of your most extensive houses. This is really a national work, and its author deserves well of his country.

Each tree is considered principally with reference to its geography and history, soil and situation—its propagation and culture, accidents and diseases, properties and uses—its use in the arts and commerce, and its application to ornament.

The work, as far as I have seen it, more than equals my expectations, both in its literary and scientific merits. The author has devoted many years to the subject, and has availed himself of the opportunity to travel extensively in the United States, as well as in various other countries. It is very evident that ancient and modern works have been rendered subsidiary to the object. The book is not confined to the forest trees of America, but treats of the important fruit and ornamental trees, and these are scientifically and popularly described.

The undertaking, I imagine, cannot fail to be useful and attractive. It will be especially welcome to those who are engaged in commerce, in the construction of ships, public works, or in the mechanic arts where wood is employed.—The whole work is interspersed with numerous historical facts, important to be known, and with many legendary allusions that will prove interesting to the general reader.

I have been very successful this season in raising a large stock of poultry, and I am almost tempted to say my say about chickens. Perhaps I may another time.

Wishing you all success in your important undertaking,

I am, dear sir, yours, very faithfully,

JNO. O. CHOULES.

To J. S. SKINNER, Esq.

THE POETRY OF RURAL LIFE.

THE HOWITTS, MARY, as well as her kinsman, are deserving of honorary membership in every society formed for promoting attention to Agriculture and Horticulture—though they are probably incapable of deciding critically between the merits of Devons and Durhams—though they may not be able to determine, at a glance, the best one in a drove of hogs—one which will take on the most fat, in the shortest time, on the least swill. It can hardly be doubted that their writings are as well fitted to produce a taste for rural pursuits, as though they dwelt exclusively on the peculiar excellencies of certain classes of animals when brought to the test of the milk pail or meat market. Not that we underrate these last—far from it. We go for the *useful* as well as and even a little before the *beautiful*, and in no way do we think we can more effectually promote the useful, than by embellishing it with the beautiful associations of the cultivated minds. It is the very unmitigated grossness that does, or is thought to, characterise too exclusively all farming pursuits, which disgust many men and women, whose example if encouraged would tend essentially to render farming what it ought to be, the most delightful of all pursuits to which taste and intellect can be devoted. We envy not the utilitarianism that excludes every thing of the *imaginative* from the studies of the school and the farm-house; and so far from emulating such a course, we shall act in accordance with our belief that the best interests of Agriculture can be most effectually benefited by contributing to invest country life with all the attractions that can purify the taste, refine the manners, and elevate the intellect of man and woman.

It is in this frame of mind that we seize on a paragraph from some daily paper, eulogising THE TASTE FOR FLOWERS, as an introduction to the beautiful lines of MARY HOWITT, on a similar subject. "We want no better evidence of a good heart than the passionate love of flowers," says the editor, whose name (if we knew it) should have honorable notice at our hands—"a lover of beautiful flowers—flowers in all their elegant variety," he continues, "must needs be a lover of the human species, with a heart open to the griefs of his fellow-beings, and an ear ever ready to hear others' misfortunes, that he may relieve them either by kind sympathy or more substantial demonstrations. We can easily imagine every good quality of the human heart wedded to a proper estimation of flowers. A maiden in her garden is secure from insult and protected against libertine desires. In such a position she can excite no impure thought. A boquet, it seems to us, is a talisman which all ladies would do well to carry. * * * During the week flowers have been plentiful. The markets each morning teemed with the various hues in which Nature has painted her prettiest productions. These flowers were made up, quite tastily, in bunches, and sold for a mere trifle. Consequently almost every market has, for three or four days, been appropriately and refreshingly decorated. We would that June—the month of flowers—had three hundred and sixty days, instead of thirty, allotted to it. Humanity is always more what it should be in June than at any other period."

And now for the beautiful philosophy of MARY HOWITT—the more beautiful that it is clothed in Poetry—as a handsome (by which we mean intelligent) face never looks handsomer than when peeping from under a quaker bonnet.

THE USE OF FLOWERS.

BY MARY HOWITT.

GOD might have made the earth bring forth
Enough for great and small—
The oak tree and the cedar tree—
Without a flower at all.

We might have had enough, enough
For every want of ours,
For luxury, medicine and toil,
And yet have had no flowers.

The ore within the mountain mine
Requireth none to grow,
Nor does it need the lotus flower
To make the river flow.

And clouds might give abundant rain,
The nightly dews might fall,
And the herb that keepeth life in man
Might yet have drunk them all.

Then wherefore, wherefore were they made,
And dyed with rainbow light,
All fashioned with supremest grace,
Up-springing day and night—

Springing in valleys green and low,
And on the mountain high,
And in the silent wilderness,
Where no man passeth by?

Our outward life requires them not—
Then wherefore had they birth?
To minister delight to man—
To beautify the earth—

To comfort man, to whisper hope
Whene'er his faith is dim,
For, *whoso careth for the flowers,*
Will much more care for Him.

TRIALS OF SULPHURIC ACID AND BONES FOR TURNIPS.

BY R. W. PURCHAS.—1845.

	T.	*cwt.*	*lbs*
FIELD No. 1.—Soil, sandy loam upon old red sandstone, so completely worn out by the late tenant that a part without any manure, lying between the acre with acid and bones and the acre with dung, produced only, per acre.....	0	5	20
One acre, manured with 160 bushels of turf-ashes wetted with water	8	14	32
One acre, manured with 160 bushels of turf-ashes, 2 bushels of fine bone-dust, and 80 lbs. of brown acid (oil of vitriol), costing 12s.; the bones and acid dissolved and treated as below.....	14	5	68
One acre, manured with 20 yards of dung.	14	11	68

This field was limed with 108 bushels of lime per acre in 1842.

FIELD No. 2.—Soil, stone brash upon old red sandstone, limed in 1841.	*T.*	*cwt.*	*lbs.*
One acre, manured with 15 bushels of coal-ashes and 15 bushels of charcoal-dust, drilled in with the seed, produced.....	4	8	64
One acre, manured with 80 lbs. of brown acid and 2 bushels of fine bone-dust dissolved, mixed with 500 gallons of water, and sprinkled with a water-cart over the land before ridging up; and 15 bushels of coal-ashes, and 15 bushels of charcoal-dust, drilled in with the seed.....	12	11	48

The Swedes (Skirving's) were planted on the ridge, the first and second weeks in July, at 24 inches; the plants thinned to 9 inches; horse and hand-hoed three times.

Pulled, topped, tailed, and weighed, 14th January, 1845.

I had the brown sulphuric acid, strength 1·750, at ¾d. per lb., from that highly respectable manufacturer, Mr. James Gibbs, Bristol; and the fine bone-dust, of excellent quality, from Messrs. H. and T. Proctor, Bristol, at 26s. per quarter.

The acid and bones for field No. 1 were treated as follows:—for 1 acre, an empty hogshead of about 100 gallons, with one head out, was used: 2 bushels (or 16 gallons) of bone-dust was put into the cask or tub, then 80 lbs. (or about 4½ gallons) of acid, the mass being well stirred; to this was added 24 gallons of *boiling* water; the mixture being well stirred the whole time the water was being put *in*, to keep down the violent ebullition that ensued. In a few minutes the bone-dust was perfectly dissolved, and fit for use. The mixture was then taken in the tub into the field, put by the heap of turf-ashes, which being very dry, about 500 gallons of water were gradually added to the mixture, and thrown over the ashes; which, being well mixed, were then put into carts and distributed with a shovel into the drills, the ground ridged up, and immediately sown.

I put in about 3 acres per day, using three old hogsheads or tubs (worth about 5s. each;) and, when taken to the field, two lots were put together, the empty tub being used to mix the proper quantity of water before throwing over the ashes.

A neighboring farmer had one carboy of acid *last* year; he used *dried mud* from a horse-pond to mix with the acid and bones: and he is so satisfied with the result that he has ordered 10 carboys of acid *this* year. My friend says the acid and bones beat every other manure, (guano, dung, &c.;) and are the *cheapest* and best of all manures for growing turnips. The soil, a poor sand, was limed with 108 bushels per acre, immediately before the mixture was put on.

I am convinced that, without lime in the soil, acid and bones will not act; this I witnessed in a neighbor's field last year—the field six years ago was part of a common, it was then broken up, and part limed the following year. Last year the whole field was planted with turnips—using 2 bushels of bone-dust and 80 lbs. of acid per acre; put on as on my field No. 2: the result was, the part limed produced a good crop for the season, beating 15 loads of dung; but the turnips on the part not limed, although coming up well, very soon died away, and in less than a month not a single plant was to be seen.

In the field No. 2, the acid and bones were treated as No. 1; when taken to the field in a water-cask holding 250 gallons of water (twice filled,) was used with half the quantity of mixture, and sprinkled over the land before being ridged up; the ashes were then drilled in with the seed.

His Grace the Duke of Richmond's plan of running the mixture and water *along the drills, after ridging*, is a much better plan than the above; and which, for the future, I shall adopt when using the mixture in a liquid state.

In every trial of acid and bones the turnips came into rough leaf a week before those planted the same day with other manures.

Pilstone, near Chepstow, May 21, 1845.

[Jour. of the Royal Agricul. Society of England.

ON THE USE OF SULPHURIC ACID WITH BONES AS COMPOST.

BY P. DAVIS.

WITH reference to Mr. Pusey's suggestion as to the propriety of using bone-dust (dissolved in sulphuric acid) along with *compost* instead of *water* for turnips, I can confirm his idea from practice, having last year manured 5 acres with only 13 bushels of bone-dust dissolved in 270 lbs. of sulphuric acid and 150 gallons of water. After standing twenty-four hours, the liquid was mixed with 3 cart-loads of *coal-ashes*, and left to remain for a week, during which time it was turned over two or three times. The mixture was then drilled along with the seed, and the result was a fair crop of common turnips, off a piece of poor land, without other manure, and at the cost of only 12s. 9d. per acre.

Milton House, near Penbridge, Herefordshire, April 25, 1845. [Ib.

EDITOR'S TABLE.

LATE PUBLICATIONS
ON AGRICULTURE AND KINDRED SUBJECTS.

We have already intimated, that if we had time to enter into a thorough examination of them, we might yet not deem it expedient to remark very critically on the contents and practical value of the books which it may be the pleasure of publishers, from time to time, to place on our table—That duty is left with more propriety, and in better hands, as it seems to us, with the regular reviewers of the Literature of the Country—of which it is no longer a question, Agricultural Literature is to form an interesting department.

We are prepared furthermore to say, that so limited are yet the offerings of our Booksellers, in works on Agriculture and Natural History, that Farmers might well buy them all at a venture, and even then their Libraries would not *begin* to compare with that of the Lawyer, the Doctor, or the well-bred, educated Merchant.

Except the American Institute and the New-York State Agricultural Society, we know of no association of Farmers possessing a Library, though we doubt not that in Boston, deservedly called the Athens of America, there must be such a collection of Agricultural works. While this is the reproachful truth, as to the follower of the pursuit from which all others draw their life's blood, how many volumes does the Farmer suppose there are in the hall of the *Mercantile* Library Association of New-York?—answer—21,312! with every necessary appointment and facility to enjoy the treasures they contain. When will Agriculturists awaken to a full sense of the dignity and the wants of their profession, and to what is yet to be done to secure for it that predominance of intellectual and political power, which ought to flow from and correspond with their superior numbers and their productive labors, preponderating as they do over that of all other classes united?

JOHNSON'S AGRICULTURAL CHEMISTRY—Republished by Wiley & Putnam in 2 vols. 4 parts, pp. 619, with an Appendix of 90 pages.

This is a work which professes to be written for "practical Farmers," and all who are of that category ought to have it, for it must be valuable if it correspond with the well-founded fame and the avowed purposes of the author; whose numerous titles affixed to his name indicate close associations with the sciences that serve to elucidate the principles of agriculture. The author is more modest than some men we wot of, wise in their own conceit, for he admits that he does not know *quite every thing*. There are, says he, "many mysteries connected with the Nature and Phenomena of vegetable life, which we have been unable as yet to induce Nature to reveal to us." But, he eloquently adds, "the morning light is already kindling on the tops of the mountains, and we may hope the deepest valleys will not forever remain obscure." Truly, dame Nature must be very inexorable if, at the rate she is now being interrogated by the votaries of science, she does not reveal her most hidden secrets. To his remark, quoted above, Mr. Johnson appends this curious note,—"The roots of trees will travel to comparatively great distances and in various directions in search of water: the roots of *San-foin* (Esparette) will penetrate 10 or 12 feet through the calcareous rubbly soil, or down the fissures of limestone rocks in which they delight to grow."—Is this, he asks, the result of some perceptive power in the plant, or is it merely by accident that the roots display these tendencies.

Those who are in any degree acquainted with the speculations of the German Physiologists of the greatest name, in regard to the *soul*, and even the immortality of plants, will not accuse me of going *very* far in alluding to the posible existence of some such perceptive power. Von Martins gets rid of objectors by speaking of them as "scientific men to whom the power of comprehending the transcental *has been imparted in a lower degree!*"

THE BOTANICAL TEXT BOOK, for Colleges and private Students.

This is an American Work, by ASA GRAY, M. D. "Fisher, Professor of Natural History in Harvard University." The author has rendered an important service if he has given us a Book in fulfilment of its TITLE, and this we have a right to presume he has done, seeing that he occupies a most honorable Chair in the most renowned University of our country.

There are few in the United States, who have done more, and that in a manner so disinterested, to promote the study of Botany than DOCT. DARLINGTON of West-Chester, Pa. On some future occasion we may use his arguments to en-

force the study of such books as the one before us. We remember that in a Lecture addressed to the *Ladies'* Botanical Society of Wilmington, Del. (to her great honor, be it known that she can boast such an association,) he employs the persuasive remark of the Roman Orator who said—"These studies are the intellectual nourishment of youth, and the cheering recreation of age; they adorn prosperity, and are the solace and refuge of adversity; they are pleasant at home, and are no incumbrance abroad—they abide with us by night, go with us in all our travels, and lend additional charms to the attractions of our rural retreats." The strongest recommendation of this study is, in fact, that it is one which is well adapted to the *female* mind, condition and pursuits. "Its cultivation imposes no tax upon the feelings, involves no cruelty, shocks no sensibility, all its incidents and attributes are promotive of corporeal health and pure intellectual pleasure."

DOWNING'S COTTAGE RESIDENCES. Or a series of Designs for Rural Cottages and Cottage Villas, and their Gardens and Grounds; adapted to North America.

This volume of near 200 pages, so well printed and illustrated, which was offered to the American and English public, by the same Publishers, and which went to its second edition in 1844, is already too well known and too popular to need further notice. The plans of buildings and grounds look beautiful on paper, and in any deviation from the common style, if style it may be called where style there is none, there can scarcely be any harm done. One common shame of the country is, that instead of having a portico or piazza, as it is usually called in the country, to at least every side of the house exposed to the sun, in a hot arid climate like ours, the body or frame of the house is usually exposed to its intense heat, without the protection even of trees. We could find it in our hearts to make such omission in building, any where South of New York, an indictable offence. We still want a book or essay, with illustrations descriptive of the *cheapest houses that can be built for people of the smallest means.* How easy would it be to have a portico or roof resting simply on four posts, to even every laborers hut in the land, and what a comfort to have such a place to sit, and have their children playing around them, in the open air, and yet free from exposure to rain, and to the direct rays of a scorching sun! But the subject is worthy of and shall have more special attention.

A TREATISE ON THE THEORY AND PRACTICE OF LANDSCAPE GARDENING.

This is a work by the same author and from the same publishers. Mr. DOWNING is doing for us, who were more in need of such works, what LOUDON has been doing for England. The view in the grounds at Blithewood, Dutchess County, which makes the beautiful frontispiece to this Treatise, offers an irresistible temptation to know all about the Book, while it bespeaks our confidence in the fine feelings and taste of the Author.

His work on Fruit Trees was briefly noticed in our first number, since which, those here referred to have been placed in the Library of the "FARMERS' LIBRARY."

☞ STEWART'S STABLE ECONOMY has been laid on our table by D. Appleton & Co. Comprehensive as is the title, the book contains much more than it would seem to import. This, too, is a reprint from the third English edition, and has the eminent advantage of having been prepared with additions by Mr. Allen of the American Agriculturist, giving it great additional value for American readers. "In editing this work," says Mr. Allen, "I have suppressed a few whole pages, all of which were either quite erroneous in matters of fact, or totally inapplicable to this country. About the same quantity suppressed, has been added by me, which is enclosed in brackets."

BLITHEWOOD.—*Residence of Robert Donaldson, Esq. of Dutchess County, as represented in "Downing's Landscape Gardening."*—Of Mr. Donaldson's taste and magnificent spirit for the embellishment of rural life, the public has been well and widely made acquainted in the already justly celebrated work of Mr. Downing on Landscape Gardening, of which Blithewood forms the beautiful frontispiece.

As far as the Farmers' Library may circulate and endure, its influence shall not, we are determined, be wanting to spread a knowledge of what may be done to promote, in our country, the growth of pursuits that cannot fail

"To raise the genius and to mend the heart."

While the general press of the country is employed, with all its power, in elevating Statesmen to distinction, and demagogues to the level of Statesmen—while the universal public voice is ready to shout its praises in honor of Military pretensions, let it be the province of those whose duty it is to watch over the interests of Agriculture, and the arts of peace, to claim consideration and precedence for those whose partialities and tastes lead them, like the Proprietor of Blithewood, to illustrate pursuits that tend to the refinement of public sentiment, and the promotion of public happiness. Such are the men whom it is alike the interest and the glory of Republics to distinguish. Herodotus, the Father of History, relates what, on this point, it would well become us to remember. He tells us how

the Ionians were once visited with new calamities from Miletus and from Naxos. Of all the islands, Naxos was the happiest, but Miletus was at that time in the hight of its prosperity.—In the two preceding ages it had been considerably weakened by internal factions, but its tranquility was finally restored by the interposition of the Parians, whom the Milesians had preferred on this occasion to all others, and who, being called on for their good offices, applied the following remedy: They sent as ambassadors men of the highest distinction, who, perceiving on their arrival at Miletus that the whole State was involved in extreme confusion, desired permission to examine the internal condition of their territories; and whenever, in their progress through this desolate country, they observed a farm *well cultivated*, they wrote down the name of the owner. In the whole district, however, they found but few estates so managed. Returning to Miletus, they called an assembly of the people, and placed the direction of affairs in the hands of those who had best cultivated their lands; for they concluded that they would be most watchful of the public interest who had taken the best care of their own. They enjoined all the Milesians who had before been turbulent and factious to obey these successful farmers, and the general tranquility was speedily restored.

These good farmers were in all probability educated men, who, disgusted with the corruption of trading politicians and the sway of impious men, had withdrawn from public affairs, to find quiet if not consolation on their own well-managed farms. But look at our legislative assemblies, and all our public trusts, and mark in what small proportion those who fill them are usually *taken from the ranks of practical husbandmen*; and this is more especially the case in States where education is the least diffused.

The July number of the Cultivator contains a fine specimen of American Engraving, in the Portrait of a Bull, the property of ROBERT DONALDSON, Esq.

ENTOMOLOGY AND BOTANY.—The sciences of Entomology and Botany are cultivated with exemplary assiduity by so few, that we feel in a measure called on to mention the names of G. B. SMITH, M. D., of Baltimore, and Doctor JOSEPH E. MUSE, of Cambridge, Maryland, who have successfully associated these with other useful and liberal studies. We have been favored with a recent discourse by Dr. Muse, addressed to the Dorchester Farmers' Club, containing observations of much interest on various subjects, and, among others, on a *new variety of insects then threatening the Wheat crop*; and on experiments in the application of Electricity to Agriculture. We can only take room now for what he says, we are sure in just praise, of the "American Journal of Agriculture and Science," lately established at Albany, N. Y., and conducted by Doctors EMMONS and PRIME, gentlemen of eminence in science.—Of this Journal the Doctor further says—and there need be no better judge—"it has commenced, in its second number, a series of articles upon insects injurious to vegetables, with descriptions and colored figures of the insects. Price, $3 per year. This Journal should have a place in every Farmer's library." We shall ask of the publishers the favor of an exchange.

AGRICULTURAL CONVENTIONS.—Among other sensible resolutions, adopted by one lately held at Columbus, Ohio, was one to petition the Legislature to pass a law to *tax dogs*, in the hope of diminishing the great number of worthless curs that infest every part of the country, and by their ravages present great obstacles to the successful progress of Sheep-husbandry in Ohio. The same reasons exist for similar acts in many other States. Such resolutions sound well on paper; their expediency is obvious to every man of common sense. It is safe to assume that millions of dollars are annually lost to the nation, not so much by the number of Sheep killed as by restraining many from breeding Sheep, in the fear of their being thus destroyed. But, alas! these half starved, hungry dogs are, in many cases, kept in great numbers as companions, by loafers yet more worthless, who, if they have nothing else, *have votes!*

HON. ZADOC PRATT.—With his usual munificence in the encouragement of all useful institutions and enterprizes, this gentleman, who retired from the public service too soon for the public good, has sent his check for $250 to the Greene County Agricultural Society, (which has the benefit of his Presidency,) to be distributed in premiums. This liberal donation was accompanied with sagacious and patriotic suggestions as to objects most worthy of being fostered by the Society. For these we have not room, having previously given out enough to fill the September number. But if ever this worthy gentleman *should* die—which we hope never to *hear* of—we will assuredly endeavor to preserve, in the Farmers' Library, the striking features of his physiognomy and character—Let others pay their homage to those who are successful in the Forum and the Battle-field; we go for honoring the *friends of the plow!*

MARYLAND COAL.—This, too, is a matter that will not escape our attention. If any one asks how Coal-mining is connected with Agriculture, we answer, in the same way that Manufactures are. They both call for laborers, who must be subsisted on the produce of Agriculture; and much more, at present, does it behoove the landholders of Maryland and Virginia to have *in their vicinity*, as in Massachusetts, thousands on thousands swarming about their water-falls and their coal-mines, to *consume* their produce, already redundant, than to discover the means of adding to that redundance by increased production.

The nearer these consumers are to the producers, the better for the producing interest—for it is that interest, as has been well and strongly intimated by Mr. Stevenson, which pays the tax of transportation. "Our produce," says he, "until it reaches the market of exportation, does not change its character of interest; it is still the Planter's, and only becomes an article of Commerce when it touches the hand of the Merchant. The transportation, therefore, to market is as intimately connected with its value as any process of its previous preparation; and the Planter and Farmer have, therefore, a deep interest in the improvement of the internal navigation of the country." Is it not, then, obviously to their advantage that their produce should be consumed as near the field of its growth as possible—for the same reason that the market gardeners are all found near the towns, because they can undersell those at a distance from it? And, since the cost of transportation, "until it touches the hand of the Merchant," is a tax on the producer, is it not his interest that his wheat and his wool should be manufactured as near him as possible, and there put into a shape as condensed and portable as can be? Hence, is it not clear that not a pound of wool or flax or cotton, or a bushel of wheat, should pass, in a raw state, by any locality where there is suitable power to manufacture and people to consume it?

As to the Cumberland Coal, we have been well assured that great quantities of it would meet with ready sale, at a price not exceeding eight dollars per ton, *if it could be had*; but it appears that no adequate (if any) provision has been made to get it brought round from Baltimore or Washington. Is this, too, another case where every thing is to be done by—*talking!*

MANUFACTURES IN THE SOUTH.—The Richmond Whig of the 27th June, under the head, "WOOL-GROWING," contains this remarkable disclosure:

"This branch of Agriculture is now beginning to attract the attention of Farmers all through the South, and we are determined that, so far as we are concerned, it shall also deserve the notice of Agriculturists in this State.—*Now that we see and hear of Manufactories springing up in every part of the State—and, indeed, almost every part of other Southern States—it behooves all who take an interest in the prosperity of such enterprises, to be unceasing in their efforts to give strength and encouragement to them.*"

[Communicated.]

DESTRUCTION OF THE MULBERRY BY FROST. We have advices of the destruction of the *Morus Multicaulis* to a most alarming extent.—The greater portion of those growing above the 42° N. latitude, from the best information we have received, are destroyed. This will be a serious blow to the Silk interest.

It is all important that we obtain trees sufficiently hardy to withstand one severe Winter—otherwise great sacrifices will, every now and then, fall on the Silk culturists, and the benefits of this new staple, promising so much, will be rendered precarious, and discourage undertakers. We have always apprehended trouble in our Northern climate in relying on the Morus Multicaulis.

At the Ninth Annual Fair of the American Institute, the Brussa Mulberry was first introduced by Charles Rhind, Esq., obtained from the foot of Mount Caucasus, in Turkey; and there was evidence produced showing that these trees had withstood our severe winters, when the Multicaulis, with the same exposure, was completely killed. We want information. Will gentlemen who have cultivated the Brussa supply it? We believe they have passed the last Winter unharmed.

The leaf is not so large as the Multicaulis, but much thicker, and, it was stated, preferred by the Silk-worm; and the cocoons obtained by feeding on them were exhibited, of a large and beautiful kind.

Some of the genuine kind may, no doubt, still be identified, as there was a public sale of a large quantity at Newburgh. Judge Buel, Whitmarsh, &c. were purchasers.

For more particulars, see vol. 3 of Journal of American Institute, page 447, and references.

AN ITEM FOR COTTON PLANTERS.—The London Ag. Gaz. June 7, thus answers an inquiry:

"We agree with you as to the importance of this subject, and are obliged to you for the letter. But are you not aware that the East India Company has recently incurred large charges in bettering the Cotton cultivation in India, by sending out American seeds and American planters? and that the quality of Indian Cotton has become very greatly improved in consequence? You will find plenty of information on the subject in the proceedings of the Agri-Horticultural Society of India."

VEGETABLE PHYSIOLOGY AND ELECTRICITY.

PETZHOLDT'S Agricultural Chemistry, is of itself sufficient to justify public confidence in the 'Farmers' Library,' as a work which is to elevate the character of the farmer by inducing the application of scientific principles, and a method of investigation to his routine of daily duties. The only way to elevate (not in Mike Fink's phrase, when he told his brother, who was shooting the tin cup off his head, 'to *elevate* his gun a little *lower*,') the farmer is to throw into his way such information as will first teach him that there are errors in his present system, and that, not only these errors are to be corrected, but that new methods of farming and new applications of old substances, and the discovery of new ones, either as pabulum for plants or modifications of the texture of the soil can only be the result of scientific study and experiment. Petzholdt has been well selected for this object. The greatest objection to the work is the want of a proper Glossary, which I prophesy will also be the case with most future publications of this kind. Even *this* reader felt the necessity of a fuller one, although some years since, Chemistry had formed a part of his system of studies. I propose, at some early period, to supply that deficiency, if not done more satisfactorily by some one having more leisure and preparation. In the mean time I beg leave to make an extract from the 'Botanic Garden' of Dr. Darwin, *the Poet and the Physiologist of Nature.* The 'Botanic Garden' was published in 1781, and the lines selected embrace two subjects, which are thought worthy of discussion: the one by Petzholdt in Lecture VIII, on the Carbon of Plants, and the other at page 109 of your Monthly Journal, entitled 'Electricity applied to Agriculture and Horticulture.' Darwin was a man of genius, and his own age did not comprehend him. His prophesy on steam has been substantially realized, and his 'Loves of the Plants,' is the school-boy's philosophy of the Botanist. But to the extract and the notes which are taken from Part I, Canto 1, lines 457 to 472, calling "from their long repose the Vernal Hours."

"On wings of flame, *ethereal virgins!* sweep
O'er Earth's fair bosom and complacent deep;
Where dwell my vegetative powers benumb'd,
In buds imprison'd, or in bulbs intomb'd,
Pervade *pellucid Forms!* their cold retreat,
Ray from bright urns your viewless floods of *heat;*
From Earth's deep wastes *electric* torrents pour,
Or shed from Heaven the scintillating shower;
Pierce the dull root, relax its fibre trains,
Thaw the thick blood, which lingers in its veins;
Melt with warm breath the fragrant gums that bind
The expanding foliage in its scaly rind;
And as in air the laughing leaflets play,
And turn their shining blossoms to the ray,
Nymphs! with sweet smile, each opening flower invite,
And on its damask eyelids pour the light."

Line 462. The fluid matter of heat, or caloric, in which all bodies are immersed, is as necessary to vegetable as to animal existence. It is not yet determinable whether heat and light be different materials, or modifications of the same materials, as they have properties in common. They appear to be, both of them, necessary to vegetable health, since, without light, green vegetables first become yellow; that is, they lose the blue color, which contributed to produce the green; and afterwards they also lose the yellow and become white; as is seen in cellery blanched or etiolated for the table by excluding the light from it.

The upper surface of leaves, which I suppose to be their organ of respiration, seems to require light as well as air; since plants which grow in windows, on the inside of houses, are equally solicitous to turn the upper side of their leaves to the light. Vegetables, at the same time, exude or perspire a great quantity from their leaves, as animals do from their lungs; this perspirable matter, as it rises from their fine vessels, (perhaps much finer than the pores of animal skin,) is divided into inconceivable tenuity, and when acted upon by the Sun's light, appears to be decomposed; the hydrogen becomes a part of the vegetable, composing oils or resins; and the oxygen combined with light or calorique, ascends, producing the pure part of the atmosphere, or vital air. Hence, during the light of day, vegetables give up more pure air than their respiration injures (see Petzholdt,) but not so in the night, even though equally exposed to warmth. This single fact would seem to show that light is essentially different from heat; and it is perhaps by its combination with bodies, that their combined or latent heat is set at liberty. [Your readers can pursue this and similar points in additional note XXXIV, and in the notes generally.]

Line 463. *Electric torrents pour. The influence of Electricity in forwarding the germination of plants and their growth seems to be pretty well established,* though Mr. Ingenhouz did not succeed in his experiments, and thence doubts the success of others; and though M. Rouland, from his new experiments, believes that neither positive nor negative electricity increases vegetation, both which philosophers had previously been supporters of the contrary doctrine; for *many other* naturalists have since repeated their experiments relative to this object, and their new results have confirmed their former ones. Mr. D'Ormay, and the two Roziers, have found the same success in numerous experiments which they have made in the last two years; and Mr. Carmoy has shown, in a convincing manner, that electricity accelerates germination.

"Mr. D'Ormay not only found various seeds to vegetate sooner and to grow taller, which were put upon his insulated table and supplied with electricity, but also, that silkworms began

to spin much sooner which were kept electrified, than those of the same hatch, which were kept in the same place and manner, except that they were not electrified. These experiments of Mr. D'Ormay are detailed at length in the Journal de Physique, of Rozier, Tome XXXV, p. 270.

"M. Bartholon, who had before written a tract on this subject, and *proposed ingenious methods for applying Electricity to Agriculture and Gardening*, has also repeated numerous experiments; and shows both that natural electricity, as well as the artificial, increases the growth of plants and the germination of seeds; and opposes Mr. Ingenhouz, by very numerous and conclusive facts.—Ib. Tome XXXV, p. 401.

"Since, by the late discoveries or opinions of the chemists, there is reason to believe that water is decomposed in the vessels of vegetables; and that the hydrogen or inflammable air, of which it in part consists, contributes to the nourishment of the plant, and to the production of its oils, resins and gums, sugar, &c.; and, lastly, *as electricity decomposes water into these two airs, termed Oxygen and Hydrogen*, there is a powerful analogy to induce us to believe that it accelerates or contributes to the growth of vegetation, and, like heat, may possibly enter into combination with many bodies, or form the basis of some yet unrealized acid."

So much of Darwin; the true point, I imagine, in the philosophy of electrical Agriculture, is contained in the italics of the last paragraph, and would seem to sustain, in a great measure, the views of Mr. Seely, pp. 53, 54, of your July Journal, viz: that Electricity, if at all available, is a mere *exciting* agent, and that the texture of the soil and the pabulum of plants must be supplied from other elements of Nature.

Ohio Co. Va. CULTOR.

[Cultor is a Correspondent so much to our taste, that we should like to look behind his mask, in the hope that we might the better encourage him not only to give the fuller glossary of which he speaks, but to favor us with observations, such as the pages of the Farmers' Library may suggest on other subjects. We are quite sure that he might assist us materially in the accomplishment of designs far above and more worthy than that of merely gaining adequate pecuniary support. Supposing him to be already a subscriber to the work, and not knowing how else to reach him with a fuller expression of our hopes and aspirations, in this respect, we have addressed a letter to "CULTOR," care of the Postmaster at Wheeling, who, we hope, may still be our old friend AGNEW, if he desire it; which letter he (Cultor) will please call for. Here we can take room only to add that he cannot well excel us in admiration of the genius and forecasting mind of Darwin.—*Ed.*]

PRICES CURRENT.

[*Corrected, August 20, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 75	@ 3 81¼
Pearls, 1st sort, '45		4 06¼	@ 4 12½
BEESWAX—American Yellow		— 29	@— 29½
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 27	@— 29
COTTON—From		— 6½	@— 10
COTTON BAGGING—American		— 13	@— —
CORDAGE—American	@ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 11
Sheetings		— 6½	@— 15
FEATHERS—American, live		— 27	@— 32
FLAX—American		— 6½	@— 7½
FLOUR & MEAL—Genesee	℔ bbl.	4 50	@— —
Troy		4 43¾	@ 4 50
Michigan		4 37½	@ 4 43¾
Ohio, flat hoop		4 37½	@ 4 43¾
Ohio, Heywood & Venice		5 —	@ 5 12½
Ohio, via New-Orleans		4 —	@ 4 12½
Pennsylvania		4 62½	@ 4 75
Brandywine		4 62½	@ 4 75
Georgetown		4 75	@— —
Baltimore City Mills		4 62½	@ 4 75
Richmond City Mills		6 —	@— —
Richmond Country		4 62½	@ 4 75
Alexandria, Petersburg, &c.		4 62½	@ 4 75
Rye Flour		3 —	@ 3 25
Corn Meal, Jersey and Brand		2 31¼	@ 2 56¼
Corn Meal, Brandywine	hhd,	11 62½	@11 75
GRAIN—Wheat, Western	℔ bush.	— 90	@ 1 —
Wheat, Southern		— 85	@— 92
Rye, Northern		— —	@— 70
Corn, Jersey and North	(meas.)	— 60	@— 63
Corn Southern	(measure)	— —	@— 56
Corn, Southern	(weight)	— —	@— 60
Oats, Northern		— 40	@— 41
Oats, Southern		— 34	@— 36
HAY—North River	bales	— 75	@ 1 —
HEMP—American, dew rotted	ton	85 —	@ 97 50
" " water rotted		125 —	@175 —
HOPS—1st sort, 1844		— 12½	@— 15½
IRON—American Pig, No. 1		35 —	@37 50
" Common		32 50	@35 —
LIME—Thomaston	℔ bbl.	— 80	@— —
LUMBER—Boards, N.R.	℔ M. ft. clr.	30 —	@35 —
Boards, Eastern Pine		10 —	@11 —
Boards, Albany Pine	℔ pce.	— 7	@— 17
Plank, Georgia Pine	℔ M. ft.	33 —	@35 —
Staves, White Oak, pipe		45 —	@— —
Staves, White Oak, hhd		37 —	@— —
Staves, White Oak, bbl		28 —	@— —
Staves, Red Oak, hhd		27 —	@28 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		14 —	@16 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 35	@— 40
Shingles, 18 in	℔ bunch	1 50	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		22 —	@24 —
Shingles, Cedar, 3 feet, 2d quality		20 —	@22 —
Shingles, Cedar, 2 feet, 1st quality		— —	@17 50
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		11 —	@13 —
Shingles, Company		— —	@30 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 12½
Cut, 4d to 40d		— 4½	@— 4½
PLASTER PARIS	℔ ton	2 50	@ 2 62½
PROVISIONS—Beef, M., new	℔ bbl.	9 —	@ 9 75
Beef, Prime,		5 75	@ 6 —
Pork, Mess, Ohio, old and new		13 —	@13 62½
Pork, Prime, Ohio, old and new		10 25	@10 75
Lard, Ohio	℔ lb.	— 7¼	@— 8½
Hams, Pickled		— 7	@— 7½
Shoulders, Pickled		— —	@— 5
Sides, Pickled		— 6	@— 6½
Beef, Smoked	℔ lb.	— 8	@— 8½
Butter, Orange County		— 18	@— 22
Butter, Western Dairy		— 15	@— 16
Butter, ordinary		— 12	@— 13
Cheese, in casks and boxes		— 6	@— 7
SEEDS—Clover	℔ lb.	— 8¼	@— 9½
Timothy	℔ tierce	14 —	@17 —
Flax, Rough		8 —	@ 8 50
SOAP—N. York, Brown	℔ lb.	— 3½	@— 5½
TALLOW—American, Rendered		— 7	@— 7½
TOBACCO—Virginia	@ lb.	— 2½	@— 6
North Carolina		— 2½	@— 5
Kentucky and Missouri		— 2½	@— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 33	@— 34
American, Full Blood Merino		— 28	@— 29
American ½ and ¾ Merino		— 25	@24 — 27
American Native and ¼ Merino		— 24	@— 25
Superfine, Pulled		— 30	@31 —

Trautschold, pinx.

Lith. of G.&W. Endicott N.York.

Yours truly Liebig

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